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THE AMERICAN
JOURNAL OF PHARMACY.

DECEMBER, 1886.

LIQUOR HYDRARGYRI NITRATIS.

By Frank X. Moerk, Ph.G.

Read at the Pharmaceutical Meeting November 16th.

This officinal solution is defined as "a liquid containing in solution about 50 per cent. of mercuric nitrate [$Hg(NO_3)_2$; 327·7—$HgO.NO_5$; 161 85] with some free nitric acid."

Shortly after the appearance of the Pharmacopœia in 1882, in calculating the molecular weights of the officinal mercury compounds, I found that the molecular weight of mercuric nitrate as given in the above definition is incorrect. According to the table of atomic weights in the U.S.P. it is 323·7; the atomic weight of mercury being 199·7, nitrogen 14, and oxygen 16.

Recently, in making the calculation to prove that the parts used in the preparation of this solution yielded the amount of product as given in the definition, it was discovered that here there was another error. The formula is:

Red oxide of mercury,	40	parts.
Nitric acid,	45	"
Distilled water,	15	" to make 100 parts.

If the reaction which takes place be first written and then the molecular weights substituted for the formula, we have:

$$HgO + 2HNO_3 = Hg(NO_3)_2 + H_2O.$$
$$215{\cdot}7 \quad 126 \quad 323{\cdot}7 \quad 18.$$

These figures tell us that, the materials being pure, from every 215·7 parts HgO we can obtain 323·7 parts $Hg(NO_3)_2$. Now in calculating the amount of $HgO(NO_3)_2$ which can be obtained from 40 parts HgO, we have the proportion:

$$215{\cdot}7 : 323{\cdot}7 :: 40 : X \quad X = 60 \text{ parts.}$$

These 60 parts of $Hg(NO_3)_2$ being present in 100 parts of the solution show that the solution contains 60 per cent. and not 50 per cent., as stated in the definition.

Two explanations for this error may be given:

1st. It was the intention to form a 60 per cent. solution and thus the error confined to a misprint in the definition, or

2nd. A mistake was made in the calculation and a 60 per cent. solution gotten, the properties of which were ascribed to a 50 per cent. solution.

The specific gravity is the only test given to indicate the strength of the solution. This is stated to be 2·100. A commercial solution of nitrate of mercury was found to agree with the product as furnished by the U.S.P. formula. The specific gravity of the sample was found to be 2·065 at 16°C.

To find the percentage of mercuric nitrate, the mercury was estimated by taking 1·007 gm. of the solution, diluting with water, precipitating with hydrogen sulphide, collecting on a weighed filter, drying at 100°C. and weighing as mercuric sulphide. Weight 0·429 gm.

The reaction in the precipitation is:

$$Hg(NO_3)_2 + H_2S = HgS + 2HNO_3.$$
$$323{\cdot}7 \quad 34 \quad 231.7 \quad 126.$$

From this can be calculated the weight of $Hg(NO_3)_2$ which yielded 0·429 gm. HgS.

$$231{\cdot}7 : 323{\cdot}7 :: 0{\cdot}429 : X \quad X = 0{\cdot}5993 \text{ gm. } Hg(NO_3)_2.$$

This quantity being present in 1·007 gm. solution, the percentage is gotten by the proportion:

$$1{\cdot}007 : 0{\cdot}5993 :: 100 : X \quad X = 59{\cdot}51 \text{ per cent.}$$

Showing that the commercial solution contains approximately 60 per cent. mercuric nitrate.

A 50 per cent. solution was made by substituting 33·32 parts HgO for the pharmacopœial quantity, 40 parts. This figure was obtained as follows: If 323·7 parts $Hg(NO_3)_2$ are formed from 215·7 parts HgO, then 50 parts $Hg(NO_3)_2$ are formed from 33·32 parts HgO.

The formula is:

Red oxide of mercury,	33·32	parts.	
Nitric acid,	45	"	
Distilled water,	21·68	"	to make 100 parts.

The specific gravity of this solution is 1·885 at 17°C. decidedly less than that given in the U.S.P., although there is a larger percentage of free nitric acid present.

The percentage of mercuric nitrate was estimated as under the commercial sample. 1.075 gm. of the solution yielded a precipitate of mercuric sulphide, weighing 0·385 gm. By analogous proportions it was first found that this quantity of HgS resulted from 0·5378 gm. $Hg(NO_3)_2$, and that this corresponded to 50·03 per cent. $Hg(NO_3)_2$ in the solution.

It may be of interest to state that of the 45 parts nitric acid used in the Pharmacopœia, only 33·66 are required to form mercuric nitrate from the mercuric oxide, an excess of 11·34 parts, or 25 per cent of the quantity used, being present in the solution.

In the formula for making a 50 per cent. solution of mercuric nitrate, there is needed to form mercuric nitrate from the 33.32 parts HgO, 28·04 parts nitric acid, therefore there is an excess of 16·96 parts, or 37·69 per cent of the quantity used in the solution.

If the solution of nitrate of mercury should contain an excess of 25 per cent of the nitric acid used, then will be required for a 50 per cent. solution of mercuric nitrate:

Red oxide of mercury,	33·32	parts.	
Nitric acid,	37·38	"	
Distilled water,	29·30	"	to make 100 parts.

A STUDY OF THE USE OF MAYER'S REAGENT IN THE ESTIMATION OF ALKALOIDS.

By A. B. Lyons, M. D.*

The assumption that underlies the method of volumetric estimation of alkaloids by Mayer's reagent is, that the precipitate produced by it is a definite chemical compound of invariable composition, so completely insoluble in water that no appreciable quantity of the alkaloid can remain in solution in presence of an excess of the reagent. Conditions such as these obtain in the case of many reactions between inorganic salts, and under such conditions alone can volumetric estimations give us satisfactory and constant results. I have instituted a series of experiments to ascertain to what extent the precipitation of alkaloids by Mayer's reagent conforms to these conditions.

In a paper published some twenty years ago † Thomas B. Groves pointed out the circumstance that in titrations with Mayer's solution a point would be reached before precipitation ceased when the filtered fluid would cause a precipitate in a fresh solution of the alkaloid, showing the presence already of an excess of the precipitant. Mr. Groves observed that in some instances this apparent excess after a

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* Read before the Michigan State Pharmaceutical Association, October, 1886.

† *Pharm. Journal* II., 6, 268.

time disappeared, showing that the reaction is not instantaneously completed, or possibly that an intermediate soluble compound is first formed, which subsequently takes up a larger proportion of the alkaloid, frequently producing in this manner distinctly crystallized compounds.

My own observations, made at first in ignorance of Mr. Groves' paper, are confirmatory of the earlier ones. I found that in the case of some of the alkaloids, the solution would begin to show apparent excess of reagent when scarcely half the quantity had been added necessary for complete precipitation. The larger the quantity of fluid present, the larger the amount of this excess, which, it seems, must form a definite proportion of the entire fluid.

The practical deduction from this observed fact is, that the titration equivalent of any given alkaloid varies with the degree of dilution of the solution. If it is fixed, *e. g.*, for a solution of 1 : 200, a correction must be made in titrating more dilute solutions, *not additive, as most writers represent, but subtractive.*

The experiments, whose results are given in the following tabulated statement, aimed to gather data on which to base formulæ for correcting the results of titrations, and further, to study the influence of other variations in the conditions, such as the presence in the solution of alcohol, glycerin, etc. In all the experiments the Mayer's reagent used was 1–20 normal, *i. e.*, one-half the strength of the original Mayer's solution. Two modified forms of the reagent were prepared, No. 1 containing 5 molecules instead of 3 of potassium iodide, No. 2 containing barely enough potassium iodide to hold in solution the mercuric iodide. The quantity of mercury in all was the same, and in each experiment 0·10 gram of alkaloid was used.

In each experiment reagent was added gradually until a drop of the filtered fluid began to give a faint cloud with a fresh portion of the alkaloidal solution. The quantity of reagent required is set down in column 3 of the table. In some cases this point was passed before any reading of the burette was taken; such reading was then entered in column 4. When the precipitation was nearly complete, so that the addition of a drop or two of reagent produced only a faint cloud, another reading of the burette was frequently taken, entered in column 5. The table otherwise is self-explanatory. When not otherwise stated, the titrations were made in presence of a little free sulphuric acid—about 1 minim of 6 per cent. acid to each cc. of fluid titrated.

Name of alkaloid. 0.100 used in each experiment.	Especial conditions.	Proportion of alkaloid in solution titrated.	Mayer's Solution, 1-20 Normal.					
			Required to give apparent excess.	Added, giving large excess.	Produces only slight precipit.	Required for complete precipitation.	Excess at end of titration.	Actually consumed
Aconitine (Merck's cryst.)		1 : 200			6·2	7·3†	2·2	5·1
Aconitine, crude from Aconite root		1 : 200	3·3		6·0	6·25		
" "		1 : 400	3·5		5·9	6·3		
Atropine		1 : 200		8·		13·1	3·0	10·1
"		1 : 200		7·1		14·9††	4·3	10·9
"		1 : 200		7·0		13·6	4·0	9·6
"		1 : 400	5·2			14·0†	3·5	10·5
"		1 : 600		7·6		15·0	5·6	9·4
"	Modified reagent No. 1	1 : 200	5·5			11·2	2·8	8·4
"	" " " "	1 : 400		8·		11·6	3·2	8·4
"	" " " "	1 : 600		7·2		10·8	2·6	8·2
"	Modified reagent No. 2	1 : 400				12·9†		
Berberine		1 : 200				3·7	0·2	3·5
"		1 : 400				3·8		
"		1 : 600				4·2 to 4·6		
"	Modified reagent No. 1	1 : 200				3·8		
"	" " " "	1 : 4 0				3·8		
"	Modified reagent No. 2	1 : 400				6·0 to 7·2		
Brucine (Commercial)	Sol. slightly acid	1 : 200			7·6	8·0†	1·7	6·3
"	Sol. nearly neutral.	1 : 200	5·1		6·4	6·9	0·9	6·0
"	" " " "	1 : 400		6·8	8·4	8·8		
Brucine (Commercial)	Sol. quite neutral	1 : 400	6·0		7·6	8· to 9·2†		
"	Sol moderately acid	1 : 400			8·0	9· to 9 8†		
"	Sol. nearly neutral.	1 : 600	6·0			9 2†		
"	Mod. reagt. No. 1.	1 : 200		4·8		6·	1·3	5·7
"	" " "	1 : 400		6·	7·2	7·6		
"	KI, 0.8 added.	1 : 400		4·8		6 8		
"	" " " †	1 : 400			5·2	5·6		
"	25 per cent. alcohol present †	1 : 400		5·8	8·	9· to 10·†		
"	" " "	1 : 400		6·4	1··	11·2†		
Brucine (Merck's pure)	Sol. faintly acid	1 : 400			9·6	10 0		
"	Sol. neutral	1 : 400			11·6	? †		
"	" "	1 : 400			12·0	13·2†		
"	25 per cent. alcohol present. Sol. acid, 25 per cent. alcohol present	1 : 400			11·2	11 6†		
Cinchonidine		1 : 100	12·4			13·8	1·0	12·8
"		1 : 200	11·2			15·6	2·6	13 0
"		1 : 200				13·5	0·7	12·8
"	Mod. reagent No. 1	1 : 200				12·8*		
Cinchonine	Sol. quite neutral	1 : 200	7·9			10 8		
"	Sol. quite acid	1 : 200		12·8		14 2		

Name of alkaloid. 0.100 used in each experiment.	Especial conditions.	Proportion of alkaloid in solution titrated.	Mayer's solution, 1-20 normal.					
			Required to give apparent excess.	Added, giving large excess.	Produces only slight precipit.	Required for complete precipitation.	Excess at end of titration.	Actually consumed
Cinchonine	Sol. strongly acid.	1:200	12·0		17·4	19·4†		
"	Sol. neutral	1:400	8·0			12·4	2·4	10·0
"	Sol. acid	1:400	10·0			14·0		
"	Sol. strongly acid	1:400	11·5			14·0*		
"	Mod. reagent No. 1	1:200	7·0			8·4		
"	" "	1:400	7·1			9·4	0·8	8·6
"	" " sol. acid	1:400	8·8		12·4*	16·0††	3·6	12·4
"	Mod. reagent No. 1, 25 per cent. alcohol	1:400	6·2			11·6		
Cocaine		1:25				9·0		
"	Sol. neutral	1:200	7·2			9·7	0·7	9·0
"	Sol. acid	1:200				10·6	1·1	9·5
"	" "	1:200				12·1*		
"	" "	1:300			12·4	13·2*		
"	" "	1:400	10·0		12·8	14·4	4·6	9·8
"	Sol. nearly neutral	1:400				15·2		
"		1:600		14·0		16·0†	5·2	10·8
"		1:600			14·8	15·2		
"	Mod. reagent No. 1	1:200	8·		9·2	9·6		
"	" " "	1:200				11·2	1·8	9·4
"	" " "	1:400		11·2	12·0	14·4	4·1	10·3
"	2 per cent. KI present	1:200			9·2	11·3†		
"	8 per cent. KI present	1:300			9·6	11·2†		
"	3 per cent. KI present	1:600			12·8	14·4		
"	4 per cent KI present	1:600			11·6	13·2		
"	5 per cent. KI present	1:600			10·8	12·8		
"	Mod. reagent No. 2	1:200				12·2	1·6	10·6
"	20 per cent. alcohol present	1:400				14·5		
"	20 per cent. glycerin present	1:400				13·4		
Colchicine (Merck's)		1:300			9·2	10·1 to 11·0†		
"	Mod. reagent No 1	1:400	2·5		8·0	9·2†		
Colchicine Crude from colchicum seed)		1:200	3·2			9·2		
"		1:300	4·0		9·0	10·2		
"		1:400		6·	9·6	10· to 12·†		
"		1:600		5·	8·6	11·5 to 12·5†		
"		1:800	4·0		12·6	14· to 15·†		
Emetine		1:200	8·0		8·8	9·2 to 9·8		8·8
"		1:400	8·5		10·0	10·2	1·0	9·2
"		1:600	9·2			10·6	0·6	10·0
"	Mod. reagent No. 1	1:300				9·4	0·6	8·8
"	Mod. reagent No. 2	1:300				11·2†		
Gelsemine	Sol. faintly acid	1:200		5·8	9·6	10·0		
"	Sol. acid	1:200	3·8		9·8	10·4		
"	Sol. more acid	1:200	3·8		10·2	10·8		
"	Sol. faintly acid	1:400		8·0	9·6	11·2 to 12·0†		

Name of alkaloid. 0.100 used in each experiment.	Especial conditions.	Proportion of alkaloid in solution titrated.	Mayer's solution, 1-20 Normal.					
			Required to give apparent excess.	Added, giving large excess.	Produces only slight precipit.	Required for complete precipitation.	Excess at end of titration.	Actually consumed.
Hydrastine		1 : 100				7·2		
"		1 : 200				7·4		
"		1 : 300				7·8		
"		1 : 400				8·2		
"		1 : 600				8·4		
Hyoscyamine (Merck's cryst.)		1 : 200				9·2		
"	Mod. reagent No. 1	1 : 200		6·8	8·3	8.5 to 9·1†		6·7
Morphine	Sol. neutral	1 : 200			6·6	7·8		
"	Sol. acid	1 : 200			7·0	8·6		
"	Sol. neutral	1 : 400			6·9	9·1†		
"	Mod. reagent No. 1	1 : 200				8·8	0·6	8·2
Pilocarpine		1 : 200	4·8			18·8		
"		1 : 200				19·4	2·3	17·1
"	Titrated without filtration	1 : 200			16·4 ††	21·4†	1·4	20·0
"	Mod. reagent. No. 1	1 : 200	9·		14·0	15·2	1·6	13·6
"	" " "	1 : 200			13·6	14·3††	1·4	12·9
Quebracho alkaloids		1 : 200				8·2 to 8·6		
"	Sol. slightly acid	1 : 400				9·6		
"	Sol. more acid.	1 : 400				10·4	1·0	9·4
"	Sol. slightly acid.	1 : 600				11·2		
Quinine		1 : 200	8·8		14·0	15·5	2·7	12·8
		1 : 400		12·8		16·8		
	Sol. neutral	1 : 400	11·6		15·1	16·0	3·4	12·6
	" acid	1 : 400	12·0		16·0	18· to 19·†		
	Mod. reag't. No. 1 neutral	1 : 400		10·5		12·5		
	Mod. reag't. No. 1 acid	1 : 400	12·6			13·0††		
	Mod. reag't. No. 1 strongly acid	1 : 400	13·††			19·‡		
	Mod. reag't. No. 1, 25 per cent. alcohol.†	1 : 400	9·5			12·4††		
Strychnine	Sol. neutral	1 : 200	11·2		12·2	14·0		
	Sol. acid	1 : 200				11·0	0·6	10·4
	" more "	1 : 200	11·0		11·4	11·8	0·3	11·5
	" neutral	1 : 400	11·4 ††			12·0*		
	" acid	1 : 400				11.6†		
	" more "	1 : 400	11·4		12·0††			
	Mod. reag't. No. 1	1 : 200	10·4		11·6	12·8		
	" " "	1 : 400	11·2		11·6	13·6		
	Mod. reag't. No. 1 acid	1 : 400	11·2			12·0		

† End of reaction not well defined.

†† Modified reagent No. 1.

‡ Precipitate forms distinct crystals.

* Precipitate forms and redissolves, more reagent again producing precipitate.

OBSERVATIONS.

Aconitine.—Titrations give pretty uniform results. The end of the reaction is generally quite sharply defined, and dilution has less influence than in the case of most alkaloids. For fluid extracts and

tinctures, estimations of alkaloid can be very satisfactorily made by the titration method. Since the character of the alkaloid is easily changed by heat and the action of chemicals, the method cannot be trusted in the examination of solid extracts and still less for commercial aconitine. In all cases the physiological test should supplement the estimation by titration of this alkaloid.

Atropine.—Results of titrations vary greatly with different samples of the alkaloid, and are much influenced by variations of conditions. The end of the reaction is never very sharply defined. After reaching a certain point it will be found that a drop of the reagent will produce a precipitate which immediately re-dissolves, while addition of several drops will produce a distinct precipitate. If collected at once and weighed, the precipitate will be found to fall much short of the theoretical weight, whereas if allowed to stand a few hours, it becomes firmly adherent to the sides and bottom of the containing vessel, but has a resinous appearance; its weight is then near what theory requires. I have not observed in this precipitate any tendency to crystallize. Most of my experiments were made with commercial atropine, containing no doubt a considerable admixture of hyoscyamine. A sample of Merck's pure atropine showed, however, the same peculiarities, somewhat exaggerated, perhaps.

From my experiments, the following practical rule may be deduced for interpreting the results of a titration of atropine, Mayer's reagent N 1-20 being used, and the end of the reaction being fixed at the point where two drops of reagent, added to the filtered solution, produce only an evanescent cloud.

RULE.—For each cc. of fluid present at the end of the titration deduct from the quantity of reagent consumed 0·05 cc., and multiply the remainder by 7·5. The product will be the quantity of alkaloid present, expressed in milligrams.

If the modified reagent No. 1 is used, its equivalent may be taken as about 8·7 mg., the dilution of the alkaloidal solution being between 1:200 and 1:400. The ordinary reagent is probably, on the whole, to be preferred. If the excess of reagent is estimated and deducted from the amount consumed in the titration, the equivalent becomes, where the ordinary reagent is used, about 9·5 to 10 mg.; with the modified reagent, No. 1, about 12. mg.

Berberine.—Mayer's reagent produces in solutions of berberine, as in those of morphine, a bulky crystalline precipitate. The titration

equivalent of the alkaloid is remarkably high. Results of titration in solutions 1:200 to 1:400 are reasonably constant, but the alkaloid is nearly always associated in the plants in which it occurs with others having a very different behavior towards Mayer's reagent. The estimation of this alkaloid is moreover easily made by a colorimetric method. It is noticeable that very little excess of reagent is required for the complete precipitation of berberine, and the alkaloid might, therefore, possibly be used to estimate excess of reagent, but for this purpose strychnine is to be preferred.

Brucine.—Results of titrations vary widely, and apparently capriciously under varying conditions.

In solutions exactly neutral, a larger quantity of alkaloid is required than in those containing a little acid, the end of the reaction being ill defined. On the other hand addition of more acid, a small proportion after all, gives a high result in the titration. The alkaloid is so easily determined by other methods that the use of Mayer's reagent cannot be recommended where this alkaloid is in question, as *e. g.*, in the examination of preparations of nux vomica and Ignatia.

Cinchonine and cinchona alkaloids generally do not give satisfactory titrations, as has been long since observed. In roughly estimating the total alkaloids in a preparation of bark, the titration method may be adopted for rapidity, an arbitrary equivalent being assumed for the value of Mayer's reagent. Observation shows that this must be a very low one, viz.: not far from 5 mg., for reagent N 1-20.

Cocaine.—[This subject has been recently pretty fully discussed by the writer in the columns of the JOURNAL, and the conclusions then reached need not be here restated.]

Colchicine can be satisfactorily estimated by Mayer's reagent, provided there is present in the solution a somewhat large proportion of free acid. It requires that about 10 per cent. of the volume of the solution shall be dilute sulphuric acid (1 vol. acid in 5). Under this condition, the results of the titration are to be interpreted by the following rule: Correct the result obtained by subtracting for each cc. of fluid present at the end of the titration 0·08 cc., and multiply the remainder by 29 to obtain the quantity of colchicine in milligrams.

Emetine may be estimated by Mayer's reagent with a fair degree of precision. Correct the result by subtracting for each cc. of fluid present at the end of the titration 0·038, and multiply the remainder by 12 to obtain the quantity of emetine in milligrams.

Gelsemine gives results which vary considerably, especially with the degree of acidity of the solution. The titration method is, however, a useful one in the case of this alkaloid, because it is somewhat difficult to separate it in a pure condition, and the quantity contained in the drug is at most small. If the solution contains 1 : 200 of alkaloid, the titration equivalent may be taken as 9·5 mg.

Hydrastine.—Results vary greatly, according to the degree of dilution of the solution. It will rarely be advisable to attempt estimation of the alkaloid by titration. The following rule may, however, be formulated: Correct the result by subtracting for each cc. of fluid present at the end of the titration 0·025 cc., and multiply the remainder by 14·9, to obtain the quantity of hydrastine in milligrams.

Hyoscyamine resembles atropine in its behavior. The number of experiments made with it was not sufficient to serve as a basis for any useful deductions. It must be understood, of course, that this alkaloid is accompanied in the drugs in which it occurs by others, and that therefore there is rarely occasion to make an estimation of it by Mayer's reagent.

Morphine.—In solutions containing 1:200 to 1:400 Mayer's reagent produces a white precipitate which momentarily takes a yellowish shade, and then the whole fluid sets into a translucent jelly from crystallization of the precipitate; only tolerably strong solutions are precipitated by the reagent immediately, the limits of the reaction for practical purposes being reached in solutions containing 1:2000, although weaker solutions, up to 1:3600, may show a distinct precipitate. This is in strong contrast with the behavior of most of the alkaloids, which are precipitated copiously in solutions containing 1:30,000 to 1:80,000.

In the more dilute solutions of morphine, the precipitate assumes the form of distinct crystals. In titrating a morphine solution with Mayer's reagent, a point is soon reached where the solution gives no precipitate, either with Mayer's reagent or with a fresh morphine solution. Just before reaching this point, the solution is observed to give with the reagent, after a few seconds, a translucent gelatinous precipitate, resembling exactly precipitated alumina. The filtrate from this precipitate in a few hours yields distinct crystals. Estimation of morphine by Mayer's reagent is not to be recommended, and, of course, is wholly inapplicable to preparations of opium.

Pilocarpine.—Comment on the results of experiments tabulated

above are superfluous. The precipitate in some respects behaves much like that of atropine, but it has a strong disposition to crystallize. Notwithstanding this fact, the precipitate varies more widely in weight than in the case of any other alkaloid with which I have made experiments, and that in a most capricious manner. Moreover, solutions prepared from fluid extracts, etc., cannot be titrated satisfactorily with this reagent, the precipitate remaining obstinately suspended, and passing readily through any paper filter. The results are reported mainly as a warning to others not to attempt the impracticable.

Quebracho alkaloids resemble in their behavior those of cinchona bark. Titration with Mayer's reagent can only serve to indicate roughly the comparative value of different preparations. Of course, it does not enable us at all to discriminate the several alkaloids present, which differ widely in their therapeutic action.

Strychnine gives us as satisfactory a titration with Mayer's reagent as any alkaloid in the list. Unfortunately it is associated always in the drugs which contain it with other alkaloids, whose behavior is not so exemplary. From the completeness of its precipitation, we can make use of this alkaloid in estimating excess of Mayer's reagent in the titration of such alkaloids as require a large excess.

ASIMININE.[1]

By J. U. Lloyd.

Process for Obtaining the Alkaloid.—Extract the seeds of Asimina triloba (papaw) with alcohol; evaporate the alcohol, adding towards the last water enough to precipitate the oils; acidulate with acetic acid, stir well, and after 24 hours filter. Ammonia water is cautiously added to the filtrate until in slight excess, care being taken to avoid a strong alkaline reaction. The precipitate is collected and, while moist, agitated with sulphuric ether in successive portions; the ethereal layers are decanted, mixed, evaporated, and the residue is dissolved in a little alcohol. To this solution, hydrochloric acid in slight excess

[1] Advance proof from Drugs and Medicines of North America.

is added, when, if concentrated, a magma of crystals of the hydrochlorate of the alkaloid will be produced. If the solution is dilute, evaporation will be necessary. These crystals are purified by crystallization from hot alcohol, then dissolved in water, precipitated with ammonia and the amorphous alkaloid is dried. The yield is small, but considerable of the alkaloid is lost in the process of purification. In working large amounts, an increased yield would result after the first batch.

Properties.—This alkaloid is white, odorless, tasteless, and practi-

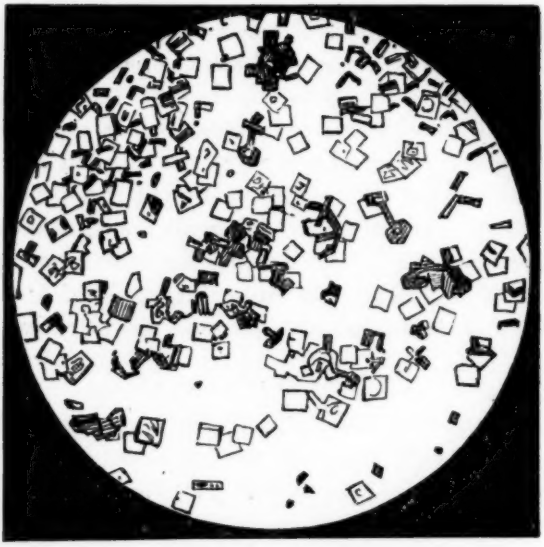

FIG. 1.—Hydrochlorate of Asiminine, magnified.

cally insoluble in water. It dissolves freely in ether and alcohol; less freely in chloroform and benzol. Upon evaporation of the solvents, it separates in an amorphous condition and we did not succeed in crystallizing it. The soluble salts are bitter, and produce copious precipitates with the usual alkaloidal reagents. Salts of asiminine and the usual acids employed in the commercial production of alkaloidal salts, dissolve freely in water (excepting the hydrochlorate, which is less soluble), producing bitter liquids, from which dilute alkalis precipitate the alkaloid. We did not succeed in crystallizing either the nitrate or the acetate, but the hydrochlorate crystallizes

easily from alcohol, forming beautiful squares, (Fig. 1[1]) and the sulphate in lamina of crystalline nature. Figures 1 and 2 are accurate illustrations of these crystals. The principal salt owing to its easy production in a pure crystalline condition will be the hydrochlorate if this alkaloid should come into demand as a medicinal agent.

Hydrochlorate of asiminine is white, odorless, and to the taste at first sweetish and then bitter, leaving a bitter after taste. It crystallizes from alcohol in transparent square plates (Fig. 1) or in groups

FIG. 2.—Sulphate of Asiminine, magnified.

of crystals composed mainly of the interlocked sections of cubes.[2] Even if the alkaloid be in minute amount, it forms, with nitric acid at once a carmine red which quickly changes to a deep dark purple color. This reaction is very delicate and is similar to that of concen-

[1] These crystals are from acid solution, and made by cautiously adding hydrochloric acid diluted with alcohol, to a film of the alkaloid that was deposited from an ethereal solution directly upon the slide. This gave better crystals than the evaporation of an aqueous solution.

[2] These crystals appear upon the slide to be portions of cubes in which the upper and lower faces alone are developed.

trated nitric acid on morphine salts, excepting that the color is not *blood* red, and instead of becoming lighter, darkens for a time to purple and then changes to deep red, but not yellow. The inexperienced might possibly confuse asiminine with morphine under the similar test. With sulphuric acid it effervesces, dissolves, turns greenish yellow slowly, afterwards yellowish red, then dark red, and the liquid remains this color. Hydrochloric acid does not affect it; but the addition of a little sulphuric acid and a gentle heat produces a purple color similar to the morphine reaction with same reagent. Mercuric chloride causes a precipitate in solutions of this salt. Chlorine water does not affect the alkaloid, but the solution of its muriate is precipitated white.

PREPARATION OF SUBIODIDE OF BISMUTH.

By Caswell Mayo.

Subiodide of bismuth is mentioned by Gmelin (Hand-book of Chemistry, Watts, iv. 437) as a powder which is precipitated when the iodide of bismuth (formed by the fusion of the two metals) is boiled with water. Its color is given as chestnut brown by Berthenot, as red by Arppe.

It has recently been revived as a topical application to indolent ulcers, and can be formed by triturating 306 parts of subnitrate of bismuth with 165.6 parts of iodide of potassium and sufficient dilute hydrochloric acid to form a paste. The paste becomes yellow and is then thrown into water, when the reaction is completed and the amorphous, heavy, adhesive, brick-red powder is precipitated. It is insoluble in water, alcohol, ether and chloroform, and is decomposed by the strong mineral acids with liberation of iodine, and by strong alkalies with liberation of bismuth oxide.

The formula is generally given as BiOI; I think it probable that it should be $BiOIH_2O$, though my experiments have not established this conclusively.

It has been mentioned in several journals lately, but I have not seen elsewhere any definite directions for the manipulation.

SYRUPUS SCILLÆ COMPOSITUS.

By Geo. H. Ochse, Ph. G.

This syrup is one which frequently causes the pharmacist considerable trouble. The formula of the present pharmacopœia is a good one; but the process consumes considerable time and requires careful manipulation if a clear syrup is to be obtained. The writer has been in the habit of employing the formula of Mr. C. A. Werckshagen with uniformly good results. Coxe's hive syrup prepared according to this process is always clear and effective, and as all the materials are already prepared it does not consume much time to make the syrup. The writer has never noticed any fermentation, and if the fluid extract of senega is exactly neutralized with ammonia no gelatinization can occur. The following is Mr. Werckshagen's formula:

℞ Aceti scillæ Oi.
Antimonii et potassii tartrat. gr. xxiv.
Extracti senegæ fluidi, f℥ ii.
Syrupi simplicis q.s. ad f℥ xxiv.

Evaporate the vinegar of squill to the consistency of a soft extract to remove the acetic acid; then add 18 fluidounces of simple syrup and apply heat; when clear add the tartar emetic and stir until dissolved; then take off the fire and add sufficient syrup to make the whole measure 22 fluidounces; lastly, when cold add the fluid extract of senega.

CHEMICAL NOTES.

(Brief Abstracts from Theses.)

Hydrargyrum cum Creta.—A sample of this preparation made according to the pharmacopœial formula of 1870 and over two and a half years old, was examined by Wm. S. Young, Ph. G. It lost over sulphuric acid 0.25 per cent. of moisture; water dissolved 0.75 per cent. containing a trace of mercuric salt; dilute acetic acid dissolved 63 per cent. including mercurous and a trace of mercuric oxide; dilute hydrochloric acid now removed merely a trace of mercuric oxide; the residuary metallic mercury weighed 34.5 per cent.

Two samples made according to the present formula and respectively six and two months old, were examined in the same manner, and gave

Moisture 0.16; aqueous solution 14 4; acetic acid solution 50.5; mercury 33 per ct.
" 0.12 " " 11.76 " " " 49.3 " 38 "

Hydrochloric acid dissolved nothing. In the acetic acid solution mercurous salt was found, mere traces of it in the last one, and a somewhat larger quantity in the older sample.

Nickel bromide was prepared by A. Damer Drew, Ph. G., by treating the granulated metal with bromine under water, and carefully evaporating the dark green solution, when deliquescent deep green needles are obtained, which dissolve freely in water, but are much less soluble in alcohol. The reaction of hydrobromic acid upon the metal, aided by heat, is very slow. Powdered nickel heated to redness, absorbs bromine vapor, yielding bright yellow scales of the anhydrous salt, which are deliquescent and dissolve in water with a green color. The salt has been employed medicinally as a hypnotic and sedative, and is conveniently administered in the form of

Syrup of Nickel bromide.—Put into a pint flask 12 oz. of water, add 377 grains of bromine and 137 grains of granulated nickel, digest at a gentle heat until reaction ceases, filter, and add sugar 24 oz. and sufficient water to make 32 fluidounces. The syrup has a beautiful green color, and contains 5 grains of crystallized nickel sulphate to the fluidrachm, which is an average dose.

Manganese sulphate.—Two commercial samples, one of American, the other of German manufacture, were examined by Doane Herring, Ph. G. Both were found free from zinc, iron and copper, but contained magnesium, which was precipitated by ammonium phosphate from the solution of the salt previously deprived of manganese by excess of ammonium sulphide. The amount of the impurity was not estimated.

Bismuth subnitrate.—Four commercial samples of this salt were examined by Samuel L. Rambo, Ph. G. On drying the salt at 120°C. the loss in weight from the evaporation of moisture varied between 2.0 and 3.42 per cent., and the oxide resulting from ignition, weighed 79.2, 79.8, 80.2, and 80.25 per cent. Using Fleitmann's test two samples were found to be free from arsenic, the other two containing

slight traces of that metal. By boiling with acetic acid, treating the filtrates with hydrogen sulphide, and evaporating the filtered liquids, a minute quantity of residue was left in each case. In one of the samples a trace of the sulphate was observed, and the presence of traces of carbonate and chloride was indicated in each sample. The four samples are regarded to be of medicinal purity.

Chlorinated lime is now often met with put up for retail sales either in glass bottles or in paper boxes lined on the inside with rosin. Robert C. Bicknell, Ph. G., examined one specimen put up in glass and found it to contain 35 per cent. of available chlorine; the high price of the container as compared with the cost of the contents is regarded as the only objection to this form of package. A number of paper packages were examined, the top layers of which were generally found more or less deficient in chlorine strength, while in the interior from 30 to 33 or 35 per cent. of available chlorine was found, and in a number of partly broken packages over 20 per cent. Some of the packages assaying 30 and 32 per cent. of chlorine had been kept more than a year.

Potassium bitartrate.—Ten samples of cream of tartar from different drug stores were examined by Claude H. Arnold, Ph. G., the pharmacopœial tests being used. Two did not contain any sulphate, and the remaining samples not an undue proportion of it. Chlorides were absent from seven and present to a limited extent in three samples. The same number showed the presence of iron, while seven samples gave no reaction with hydrogen sulphide in ammoniacal solution. Eight samples contained less, and two indicated more than 6 per cent. of calcium tartrate.

Seth C. Johnson, Ph. G., examined three samples purchased in drug stores and found them to be commercially pure, while of three samples purchased in grocery stores only one could be considered pure, the other two containing considerable amounts of calcium salt and starch.

Creasote.—Of fifteen samples of commercial creasote examined by Foster B. Eisenhart, Ph. G., seven were found to be pure, since they did not coagulate collodion, produced with ferric chloride a violet blue color rapidly changing to brown, and under the influence of bromine water gave a more or less deep red brown color, but not a white precipitate. The other eight samples consisted of carbolic acid.

CONTRIBUTIONS TO FORENSIC CHEMISTRY.

By Professor G. Dragendorff.

The author reports in a reprint from *Pharmac. Zeitschr. f. Russland*, the results of investigations made under his supervision with a number of drugs more or less employed. Some of these investigations have already been noticed in this Journal, namely, on aloïn, by Dr. J. Dietrich (A. J. Ph., 1885, p. 404); on convolvulin and jalapin, by Dr. J. Müller (*ibid.*, p. 556); on myoctonine, by Dr. Salmonowitz (*ibid.*, p. 459), and on the alkaloids of lobelia, by Dr. H. von Rosen (*ibid.*, 1886, p. 392). The remaining researches, which were first published as inaugural dissertations by the investigators, may be briefly summarized as follows:

Detection of Chloral.—Having previously shown that chloral hydrate may be abstracted from aqueous solutions by agitation with ether and acetic ether, Dragendorff recommends, based upon the researches of Baron Tiesenhausen, the treatment of urine first with petroleum-benzin, then with ether, when, on evaporation of the latter solvent, the chloral hydrate is left behind. Other organic mixtures, such as the contents of the stomach, require to be acidulated with diluted sulphuric acid, and macerated for a day with 3 volumes of strong alcohol; the filtrate is evaporated spontaneously until the alcohol has been volatilized, when the aqueous residue will yield fat, &c., to petroleum-benzin, and subsequently chloral hydrate to ether. Blood and organs containing much blood retain the chloral within the coagulum, in which it is best recognized by the production of chloroform on distilling with sodium hydrate. 0·005 gm. chloral hydrate may, by these processes, be readily recognized in from 75 to 100 ccm. of mixture.

The most suitable reactions for the recognition of chloral hydrate are the following:

The dry chloral hydrate is warmed with alcoholic soda solution and a little pure aniline; the odor of isonitril is still distinct, though faint, with 1–60,000 gm. of chloral hydrate.

Heat to 50°C. the hydrate with 1 or 2 drops of concentrated aqueous potassa solution, and a little naphthol; the blue color, produced also with chloroform, is recognized with 1–24,000 gm. of chloral hydrate.

Experiments with animals show that chloral hydrate is rapidly

resorbed and transformed into products which, like urochloralic acid, do not show the reactions of chloral hydrate.

Detection of Phenol.—Experiments were made by Dr. Woldemar Jacobson for the purpose of isolating and recognizing phenol. The organic mixtures, 100 ccm., were macerated for a day with 400 ccm. of alcohol, the filtrate was freed from alcohol by distillation at a low temperature and under reduced pressure, the aqueous residue filtered, agitated with little petroleum benzin for the separation of fat, and then repeatedly shaken with benzol, which solvent was evaporated in watch-glasses. The following reactions were employed:

Dragendorff's method: The residue was left in contact at ordinary temperatures with solution of mercuric nitrate, containing a little nitrous acid; the red color appears in half an hour with 1 phenol in 100,000 mixture.

Jacquemin's method: Dissolve 3 drops of colorless aniline in 50 ccm. of water. Dilute 5 or 10 drops of this solution with 5 ccm. of water, and add sufficient solution of sodium hypochlorite (1 sodium carbonate; 1 chlorinated lime; 10 water; filter), until a distinct violet or brown color is produced. Add of this freshly prepared mixture to the phenol, previously mixed with ammonia until the liquid is colored violet or brownish, when in a short time in the presence of phenol (1:50,000) the color will change to blue, or with less phenol (1:100,000) to green.

Landolt's reaction: Cloëtta and Schær have shown that the crystalline precipitate with bromine is still obtained in solutions of phenol diluted to the proportion 1:100,000. In separating small quantities of phenol from animal matter, Jacobson obtained amorphous precipitates with bromine, which, after drying, dissolving in alcohol and evaporating slowly, yielded the characteristic groups of needles. Minute quantities of phenol are best dissolved in little water, and then exposed to bromine vapors.

Detection of Thalline.—Blumenbach found that thalline is not, or only in traces, taken up, by agitating acidulated aqueous solutions with benzin, benzol, chloroform or ether, but is dissolved from ammoniacal liquids by these solvents, however only sparingly by petroleum benzin. Distinct reactions could be obtained by this treatment with 0.001 gm. of thalline in 100 ccm. of urine; from a similar amount of blood or food-mixture the reactions were faint, but with 0.005 gm. were distinct. The green color produced by ferric chloride is distinct

in solutions 1 : 10,000, and still recognizable in dilutions 1: 100,000. A green color is also produced by gold chloride, silver nitrate, chromic acid, chlorine water, and mercuric nitrate, and in acid solutions also by chlorinated lime and potassium ferrocyanide. Iodine colors dark brown, then dingy green; platinic chloride yellowish green; and a red color is produced by warm fuming nitric acid, by sulphuric and nitric acids, and by sugar and sulphuric acid. The solutions of thalline, if not too dilute, yield precipitates with the usual reagents for alkaloids.

Given to animals by the stomach or subcutaneously, thalline caused a dark coloration of the urine, which contained very little unaltered thalline, but after acidulation yielded to benzin, benzol, &c., a derivative colored green by ferric chloride; after precipitating the phosphoric acid with a few drops of ferric chloride the filtrate yields with more ferric chloride the red color observed by Jaksch.

Detection of Antipyrine.—Blumenbach recommends treating the aqueous infusions with petroleum benzin, and after the addition of ammonia with benzol, chloroform or amylic alcohol, when very distinct reactions will be obtained with 0.01 or 0.005 gm., and faint reactions with 0.001 gm., of antipyrine in 100 ccm. of organic mixtures.

The alkaloidal reagents produce precipitates in not too diluted solutions of antipyrine, and ferric chloride gives in neutral solution 1: 1000 a dark brown color, 1:10,000 a light brown and 1: 50,000 a light yellow color. Fuming nitric acid colors dry antipyrine dark red, and in liquids green, recognizable in solutions 1: 10,000. The solution mixed with concentrated sulphuric acid and warmed with a little fuming nitric acid, becomes deep red.

Observations with animals prove that antipyrine is rapidly resorbed and for the next 18 to 24 hours may be detected in the urine; but only for a few hours in the different organs. On the other hand antipyrine was found after putrefaction of two weeks in all organs of animals, that had been killed about two hours after swallowing the chemical or receiving it by hypodermic injection.

J. M. M.

Nitrite of Amyl in Opium Narcosis.—*L' Union Médicale* reports a case of opium poisoning, in which the inhalations of nitrite of amyl brought on a rapid cure, when belladonna had failed, and the patient was almost beyond help.—*Med. News*, Oct. 2, 1886.

PRACTICAL NOTES FROM VARIOUS SOURCES.

By the Editor.

Pulvis glycyrrhizæ compositus.—The formula of the British Pharmacopœia is identical with that used in Germany, and differs but slightly from that of the U. S. P. Dr. M. Oxley having found the powder to produce griping, proposes (*The Lancet*, Oct. 2, 1886) a modified formula in which anise is substituted for the fennel, and one-fourth part of ginger replaces an equal weight of sugar, viz.: Senna 2 p., liquorice root 2 p., anise 1 p., sulphur 1 p., ginger ¼ p., and sugar 5¾ parts.

Acorn-cacao has recently attracted some attention in the treatment of diarrhœa and vomiting in children. It is said to be made of powdered cacao seeds deprived of fat, to which are added an aqueous extract of roasted acorns, a little sugar and some roasted flour. The proportions of the ingredients are not given. A teaspoonful of the powder is mixed with cold water, heated to boiling with constant stirring, and this quantity is administered thrice daily by means of a spoon or feeding cup.

Acorn-chocolate has long been in use in Europe, and is prepared in France by incorporating 1000 parts of simple chocolate (made of cacao seeds 6000, sugar 5000, and powdered cinnamon 30 parts) with 30 parts of roasted acorns.

Hager's formula is equal parts of roasted acorns, white sugar and cacaomass, the latter being the seeds, roasted, deprived of the shells and beaten to a uniform mass in a warm mortar.

Toothache drops.—Dissolve mastic 8 parts in chloroform 14 parts and add balsam of Peru 5 parts. A few drops upon a little cotton are to be introduced into the cavity of the tooth. (Dr. Gaudet.)

Liquefy camphor and chloral hydrate, of each 5 parts, and add cocaine 1 part. A pellet of cotton soaked in this liquid and introduced into the cavity of the aching tooth is said to afford complete and lasting relief. (Dr. Gsell-Feltz.)

Mollin is highly recommended by Dr. F. A. Kirsten (*Monatsh. f. pr. Dermat.*, Aug. 1886) as a vehicle for the application of mercury and its compounds, balsam of Peru, storax, phenol, thymol, naphthol, naphthalin, chrysarobin, iodoform, salicylic acid and other substances used for inunction. Mollin is a soft soap containing 17 per cent. of uncombined fat, and is stated to be prepared by saponifying

without heat 100 parts of cocoanut oil or of fresh fat with 40 parts of solution of caustic potassa (spec. grav. 1.145, containing 15 per cent. KHO), mixing intimately with 30 parts of glycerin and heating carefully. If properly made, mollin is yellowish white and of a smooth and soft consistence, not readily altered by exposure, free from rancidity and from irritating properties, and easily removed from the skin by warm or cold water.

Antiseptic dressings are ordered by the German military authorities, according to *Phar. Rundschau, Prag,* to be prepared as follows:

Corrosive sublimate gauze.—Dissolve mercuric chloride 50 gm. in alcohol 5000 gm., and add distilled water 7500, glycerin 2500 and fuchsin 0.5 gm., the latter being added for the purpose of readily distinguishing the corrosive sublimate gauze from others. Four hundred meters of gauze are well kneaded in this solution and allowed to soak for 15 minutes; the gauze is then strongly pressed and well dried on washlines being protected from light and dust. It takes about nine hours for the complete drying of this gauze, but the time may be shortened by replacing the water partly or wholly with alcohol.

Corrosive sublimate cotton.—Absorbent cotton is soaked in the above solution and dried in loose layers.

Corrosive sublimate catgut.—A 5 per cent. aqueous solution of corrosive sublimate is prepared, in which thin catgut is soaked for about 8 hours, and the thicker kinds for 10 or 12 hours. The catgut is subsequently kept in vials with alcohol.

Corrosive sublimate silk is prepared by soaking well-washed ligature silk in a solution of 5 parts of corrosive sublimate in 100 parts of water and 20 parts of glycerin. After drying it is wrapped in oiled silk or other water-proof material; and before using, it is dipped into a 3 per cent. phenol solution, or a one per cent. solution of corrosive sublimate.

Trichlorphenol is said to have been used in Germany as a very effective remedy in epidemic erysipelas. Its composition is $C_6H_2Cl_3OH$, and it is the chief product of the action of the chlorine upon phenol. It melts at 68°C. (154.4°F.) and boils at 244°C. (471.2°F.). On studying the action of alkali hypochlorites upon phenol, Th. Chandelon observed (*Berichte D. Chem. Ges.* 1883, p. 1749-1753) that orthochlorphenol is first produced; that on prolonging the action two dichlorphenols are formed, the *ortho-ortho* and in larger quantity the *ortho-para* compound; and that finally the action results in the

formation of *o-o-p*-trichlorphenol. This reaction was previously described by W. Dianin (*Ibid.* 1880, p. 2403); at the end of the reaction the chlorophenols exist as calcium compounds, from which they are liberated by hydrochloric acid, and may then be separated by distillation with steam. Dianin stated also that trichlorphenol checks fermentation more energetically than carbolic acid, and that for this reason a mixture of phenol and chlorinated lime is far superior for the dressing of suppurating wounds than a solution of either one of these substances. (See AMER. JOUR. PHAR., 1884, p. 51.)

For the extemporaneous preparation of trichlorphenol, Prof. Bartholow, recommends (*Coll. and Clin. Rec.*, 1886, p. 216), mixing and then filtering one part of a 4 per cent. solution of carbolic acid and five parts saturated solution of chlorinated lime. Obviously, the liquid contains the new compound in combination with calcium.

Zinc salicylate is coming into use in medicine, and is prescribed in the form of solution in water. Of two commercial samples examined by F. H. Alcock (*Phar. Jour. and Trans.*, Sept. 18, 1886, p. 226), one was fairly soluble in warm water, crystallized on cooling in long needles, and when incinerated at as low a temperature as possible, emitted an agreeable odor, assumed a pink color, and finally left 20·8 per cent. of oxide of zinc. The other sample was less freely soluble in warm water, leaving behind a white powder, the filtrate crystallizing in needles; on incineration the salt did not give off the same peculiar odor, became black, and left 25·3 per cent. of zinc oxide. For the preparation of this and other salicylates, see AM. JOUR. PHAR., 1886, p. 246.

Bismuth oxyiodide is regarded by Dr. A. Sidney Reynolds (*Med. News*, Oct. 9, 1886), as being very valuable in the treatment of chronic ulceration; he states that the salt will control inflammation, allay irritation, suppress suppuration, promote granulation and induce cicatrization. He has also employed it internally in doses of 5 to 10 grains.

When a solution of bismuth subnitrate in nitric or in hydrochloric acid is diluted with water as far as possible, and is then added gradually and with continual stirring to a solution of potassium iodide, a brown precipitate is produced, which on dilution with water turns yellowish-red, and on drying yields a bright, brick-red powder, consisting in the main of BiOI, but mixed with variable proportions of subnitrate or oxychloride. To obtain the oxyiodide pure, the brown

bismuth iodide may be dissolved in hydriodic acid or in potassium iodide and diluting the solution with water. On subliming a mixture of iodine and powdered bismuth, blackish scales of bismuth iodide having a metallic lustre are obtained. This compound is permanent in the air, and is but little affected by cold water, but hot water converts it into the red oxyiodide. (See also p. 590 of this number).

ON STERILIZING HYPODERMIC SOLUTIONS.

By R. N. Girling.

Dr. A. Poehl, of St. Petersburg, in a recent article published in the *Pharm. Zeitung*, comments on the desirability of preparing solutions of the alkaloidal salts, for hypodermic use, which shall remain free from bacteria or ferment bodies, and remarks that solutions for subcutaneous injections are generally made without any antiseptic precautions.

He says: "The very act of filtration through paper, causes the filtrate to contain more micro-organisms than the unfiltered liquid contained." This may be readily understood, when the process of manufacturing such paper is considered, and unless some method is adopted to insure sterilization, both of the water used in preparing the solutions, and of the paper used in filtering them, the risk of obtaining septic solutions is considerable. Dr. Hager, who has written on the danger of employing septic hypodermic solutions, among other precautions, recommends the use of water *twice* distilled in order to render it free from volatile organic matter.

It is, however, necessary to bear in mind the fact, that the alkaloids themselves aid in developing certain forms of bacteria, and in order to prevent this, other precautions than the employment of *doubly* distilled water are necessary.

The addition of salicylic and boracic or boric acid to the solutions has been recommended, but their use is open to objection from a medical point of view.

It has been also suggested to *boil* the solutions in order to sterilize them; but as it has been demonstrated, that such a course would cause the partial decomposition of certain alkaloids, some other means had to be sought to secure the desired end.

A process, which has given excellent results in the hands of the writer, and which is not open to the above objections, inasmuch as no foreign substance is contained in the finished solution, is as follows:

Water, which has been re-distilled from a mixture of about 2 per cent. of caustic soda and permanganate of potash, (the first portions of the distillate, if showing traces of ammonia when tested by Nessler's reagent having been rejected,) is mixed with about 1 per cent. of pure chloroform. The alkaloidal salt is to be added and the solution heated in a flask, furnished with a thermometer, to a temperature of 60° to 62° C. until all traces of chloroform have been dissipated. The resulting solution is to be filtered through paper which has been folded ready for use, and afterwards been sterilized by heating to a temperature of 125° to 130° C. in an air-chamber or drying-oven, for at least one hour. Sufficient of the redistilled water is to be poured through the filter to make the filtrate, either weigh or measure accurately, the desired quantity. Last, but by no means least, the solution is to be preserved in vials which have been washed with some of the same water and dried at a temperature of 125° to 130° C. or over. The cork used, should also be washed in the redistilled water, and dried in the same manner as the vials.

Solutions thus prepared have been kept for months without showing signs of change.—*New Orleans Med. & Surg. Jour.*, Oct. 1886.

ON THE NUMBER OF BACTERIA IN ICE.

By Dr. Carl Frænkel.

This research was instituted to inquire into the representation of a Berlin company for the artificial production of ice, that natural ice was dangerous and hurtful. Dr. Bischoff had already made chemical examinations of ice obtained from the works incriminated, and had also made some bacteriological examinations of the ice, which, however, were probably faulty in some way, as for instance, keeping the ice too long after melting. Bacteria multiply rapidly in stationary water. It is not necessary to detail here Dr. Koch's method of examination of water, nor the precautions necessary in all bacterial investigation, but one or two points require notice. Water must be examined at once after collection, on account of the rapid growth of bacteria in standing water. Moreover, the water examined must be shaken up before being transferred to nutrient gelatin, on account of the tendency of bacteria to sink to the bottom. A number of separate examinations must be made of any water, since the number of bacteria is liable to vary greatly day by day; with ice special precautions are necessary. By means of a carefully purified hammer, a

piece of ice, about double the size of one's fist, was detached from the surrounding mass, washed with distilled sterilized water, and put into a sterilized glass vessel. As soon as several grams of ice-water had collected, a measured quantity was mixed with meat-solution-pepton-gelatin, and poured on glass plates. The author again insists on the necessity of examining the water directly after the ice melts.

A small quantity of ice having thawed, as equable a mixture of the constituents as possible was made by shaking, and 1 ccm. of this water introduced into nutrient gelatin by means of sterilized pipettes.

As a rule one ccm. water was introduced into two tubes, and ½ ccm. into other two. These last served in some measure to control the results, and ought to contain half as many germs as the first two. The contents of the test tubes were then poured on glass plates in the usual manner. The time required for the germs contained in ice to attain complete development varied with the temperature of the place where the plates were kept. It usually ranged between three and four days. The colonies were counted in the usual way. As with water, a large number of examinations were made of the same ice. The first ice examined was that of the North German Ice-works in Berlin, the material being described as "Natural" or "Raw" ice. This ice was taken in winter from the Rummelsburger See, a lake-like extension of the Spree above Berlin. It was usually collected when the ice reached a thickness of 15 to 20 cm. and was laid in large keeping compartments. The results of the bacteriological examination of specimens of this ice is exhibited in a long table, of which the commencement is here given.

Day on which Plate Cultivations were made.	Day of Counting.	Interval in hours.	Number of Colonies. Counted in 1 ccm.	Counted in ½ ccm.
15th February, 1886	19th February, 1886	90	220	116
			218	102
16th " 1886	20th " 1886	90	318	228
			472	224
18th " 1886	22nd " 1886	90	314	140
			260	120
22nd " 1886	26th " 1886	92	6,300	2,700
			5,580	3,300
28th " 1886	3rd March, 1886	74	158	70
			164	90
1st March, 1886	5th " 1886	94	920	440
			800	400
2nd " 1886	6th " 1886	95	80	50
			86	44

The most striking feature of the table is the great difference in the individual results. This will probably depend on the spot where the ice was formed, whether near or far from the surface, and whether near or far from the bank. It is further evident that the quantities of bacterial germs are sufficient to justify the question whether such material ought to be employed for certain purposes. Water containing so many germs, at times amounting to thousands, would be condemned for purposes of common use. Moreover, there is reason to believe that the water corresponding to such ice is very much worse than the ice represents it to be. The author finds on counting the germs in a water and freezing the water, that the corresponding ice contains only about one-fifth the number of developable germs. It is evident, therefore, that an ice rich in bacteria corresponds to an unusable water.

Figures are then given showing the results of experiments made with ice from other works, but as these were known to be from more impure sources than the ice already described, they were not so exhaustively treated. The North German Ice-works also produce ice from distilled and from spring water—far more of the latter than of the former. Examination of the spring water ice showed that it also contained too many bacteria. The company whose representations led to this inquiry manufacture about one-tenth of their supply from spring water; the remainder from distilled water, distilled over nto the freezing vessel. The ice from spring water was found to be as impure as the other natural ice supplies. The following table shows the results of examination of the ice made from distilled water, and may be usefully compared with the table already given,

Day on which Plate Cultivations were made.	Day of Counting.	Interval in hours.	Number of Colonies. Counted in 1 ccm.	Counted in ½ ccm
14th April	18th April	90	10 6	0 6
15th "	19th "	90	0 2	3 0
18th "	21st "	70	14 3	3 3
19th "	22nd "	70	8 8	2 5
20th "	23rd "	70	6 4	4 5
21st "	24th "	70	0 6	4 4
24th "	27th "	70	0 2	0 0
28th "	1st May	70	0 0	3 0
30th "	3rd "	70	0 0	0 0
1st May	4th "	70	12 '0	4 9
2nd "	5th "	70	6 5	5 2
3rd "	6th "	70	2 7	3 5
4th "	7th "	70	3 3	2 0

The author concludes that "*the common 'raw' ice, till lately, almost exclusively used, on account of the large number of bacteria capable of development which it contains, should not be taken with food—in drinks—or for medicinal purposes. It should never be used in the treatment of wounds. In these connections artificial ice made from distilled water should be employed. The use of raw ice in contact with food, which is afterwards to be cooked, is permissible, but artificial ice is to be preferred. Raw ice may be freely used where it does not come into direct contact with food.*"—*Med. Chronicle*, Oct. 1886. *Zeitschr. f. Hygiene I. Heft* 2.

TESTS FOR ALBUMIN IN URINE.

The following reagents were investigated by a committee of the British Medical Association :—1. Dr. Oliver's papers; 2. Dr. Pavy's pellets; 3. Dr. Johnson's picric acid; 4. Sir W. Robert's acid brine; 5. A solution of picric acid saturated with common salt—picric acid brine; 6. Solution of potassio-mercuric iodide with citric acid; 7. Nitric acid; *a*, with previous boiling of the urine; *b*, applied according to Heller's method; 8. Acetic acid and heat; the urine being boiled previous to acidification. The committee experimented with some artificial admixtures of albuminous bodies in fluids other than the urine, which need not here be particularized. The general conclusion obtained from these preliminary experiments was that solution of potassio-mercuric iodide with citric acid, particularly when used after Heller's method, gives the most delicate and clearly marked re-actions; and that nitric acid is, for use in the consulting room, not inferior to any but the potassio-mercuric-iodide test; its use in the two ways indicated above being taken into comparative consideration with the other tests correspondingly applied. By the use of different reagents, the committee were able to distinguish some forms of albuminous bodies from some other states or forms; for instance, peptones from egg-albumin, or serum-albumin, or the albumin of albuminuria.

As regards the clinical use of the tests above enumerated, the committee arrived at the following conclusions :

1. Of Dr. Oliver's test papers, the potassio-mercuric iodide give the most delicate reactions of all the papers, and excel nitric acid, however applied. The ferro-cyanide papers come next, but with a decided interval, and the tungstate papers third; whilst the picric-acid

papers are less satisfactory, as an inconvenient quantity has to be used. The two first named papers require the use of citric acid in the cold, which involves a possible fallacy, in that citric acid produces a precipitate when an excess of soluble urate is present in the urine. Urine of high specific gravity should consequently be diluted, to avoid this source of error; and sufficient acid must be added to render neutral or alkaline urine distinctly acid. The potassio-mercuric-iodide papers appear to precipitate all albumins indiscriminately; but the precipitates with artificial peptones are dissolved on heating, and reappear on cooling. The ferrocyanide papers do not precipitate artificial peptones; while their reaction with other albumins is keen. One apparent fallacy that might occur in the use of Dr. Oliver's papers is not noticed in the report. It happened to us once, in employing an iodide paper to test some serum drawn from a hydrocele, to find that the paper gave apparently no reaction, whereas the liquid when boiled in another tube, became quite solid. Upon taking the paper from the first portion of the liquid, however, on examining it more carefully, it was found to be coated completely with a thick layer of solid albumin, which had apparently prevented any further egress of the salt from the paper into the liquid around, in that way frustrating all further reaction. The very sensitiveness of the test induced a belief in its failure. When, however, the serum was well diluted with water, the albuminous nature of the liquid was at once completely demonstrated by the paper. It is, perhaps, possible that the same thing might occur in a specimen of extremely albuminous urine.

2. Dr. Pavy's pellets of nitric acid and ferrocyanide of potassium are reported to give as good results as the potassio-mercuric papers of Dr. Oliver, (neither of these reagents being quite so searching as the solution of the potassio-mercuric iodide). They are stated not to precipitate peptones; and, therefore, in conjunction with the iodide solution, they may distinguish the two kinds of proteid, and, so far, help in the clinical analysis of pathological conditions. In using this test, citric acid has to be first added; and this source of fallacy (as noted above) must be avoided by dilution, where the specific gravity of the urine is high. Bubbles of gas, which the pellets sometimes liberate, must also be distinguished from a precipitate.

3. Dr. Johnson's picric acid solution requires decided excess of the re-agent, or the addition of acetic or citric acid. It is reported to be most useful, giving reactions only second to those of the potassio-

mercuric iodide solution. The mixture of picric acid and urine should be boiled. Artificial peptones are thrown down by this test in the cold, but disappear upon boiling, and reappear as a cloud on cooling. The picric acid solution should be dropped into the tube of urine, held vertically, in such a way that each drop falls upon the centre of the surface of the urine, so as to obtain differentiation by the production of a film around it, if albumin be present. This cannot be managed if the solution be poured down the side of the tube, as the picric acid solution is of low specific gravity, and highly diffusible. This gives a precipitate, not necessarily albumin, in the urine of persons taking quinine. The precipitate is distinguished by its being soluble on boiling, to reappear in a crystalline form on cooling; whilst it gives the quinine reaction with chlorine water. This test also precipitates uric acid in the cold; but this cloud disappears under heat.

4. Robert's brine-test is stated to be sensitive, and very trustworthy, though not quite so delicate as the other tests. It does not precipitate peptones or quinine; and it is said to allow the discrimination of mucus from albumin, the cloud of the former being super-imposed upon the albuminous cloud.

5. Picric acid brine can be used after Heller's method, which is not possible with picric acid solution alone; owing to its specific gravity, it gives good results.

6. The solution of potassio-mercuric-iodide, with addition of acetic acid, is the most delicate test in the list.

7. Nitric acid, used by Heller's method, and added cautiously, in a somewhat diluted state, to urine just boiled, is declared to be a test of great delicacy, and to be liable to fewer fallacies than the other tests considered. The drawback to this test is its difficulty of portability.

8. Acetic acid, added so as to ensure a decided acid reaction to urine just before, or immediately after boiling, is a delicate test.

The report states of mucin, that it is precipitated by most of the re-agents which precipitate albumin. The distinction of the two clouds, when formed by Robert's brine test, has been already noticed; the same kind of indication is given with nitric acid, in Heller's method. With regard to the other tests, mucin cloudiness thereby obtained shows less ready sedimentation than albumin cloudiness, and exhibits a marked mobile satiny appearance of the precipitate when shaken in a good light.

In some urines, the potassio-mercuric iodide and picric acid tests

produce a precipitate apparently albuminous, when nitric acid affords no such indication.

Some tests are especially portable, and capable of application without the use of cumbrous apparatus; and each test has an usefulness of its own. The committee consider that any one devoting himself to the thorough use of one of the tests, will find it sufficiently precise for all practical needs, and that, by comparative use of several tests, the discrimination of differing forms of proteids may be obtained. The picric acid test, which admirably detects albumin and peptones, if boiled with caustic potash, detects, also, the presence of sugar. The committee lastly note that the knowledge of the reactions of albumins is at present imperfect, and, possibly, capable of improvement. But to the settlement of this question their functions did not extend.—*Brit. Med. Jour.*, June 26, 1886.

ON SOME NEW HYPNOTICS.

By Dr. S. G. Webber.

Several drugs have been lately given to the profession with the claim that they are valuable hypnotics. I have had an opportunity of testing these in the cases of many patients in the Adams' Nervine Asylum.

Paraldehyde has been some years in use. It has advantages over chloral. The immediate subsequent effects are less unpleasant. It very rarely causes headache on the next day; sometimes patients have a sensation of fulness or pressure in the head for a few hours after waking. I gave it in one case where the patient had been taking chloral in large doses, not measuring the dose, and had been injuriously affected by the drug. The paraldehyde gave, in this instance, better and more prolonged rest; the patient partially recovered his mental powers and some measure of strength. The paraldehyde was continued several weeks in nightly doses of forty minims. In this patient there was probably disseminated sclerosis, and it did not seem possible to do without some agent to produce sleep, at least so long as he was at home.

The chief objection to paraldehyde is its disagreeable odor and taste, and also the odor it imparts to the breath. I do not remember to have met any unpleasant symptoms arising from its use; but had never seen a case in which it has been used habitually for a long time.

The dose is from from forty-eight to eighty or ninety minims; sixty minims is the average dose. Occasionally a dose of eighty minims has failed to give the sleep which I have desired to obtain.

Urethane came into notice later than paraldehyde; it is much more pleasant to administer, having scarcely any taste or odor.

When I first gave it the dose was too small, but by increasing it to thirty grains good results were generally obtained. Sometimes much larger doses are necessary. It is quite soluble; fifteen grains will dissolve in a drachm of water.

The after effects are generally unimportant. It has seemed once or twice to give rise to nausea the day after; but often the patient says the sleep has been very natural and refreshing. It is not so sure to produce sleep as paraldehyde.

Hydrobromate of hyoscine has the advantage of being almost tasteless; and the dose is small. I began with a dose of one hundred and twentieth of a grain, as recommended by the articles I had read; but soon found this too small, and increased to a sixtieth of a grain, using the following formula, giving twenty minims:

℞		
	Hydrobromate of hyoscine	gr. j.
	Alcohol	ʒ iss.
	Water sufficient for	ʒ xx. M.

In a few instances I have given twenty-five minims of this mixture.

There is so little taste to this that it can be given in some simple drink, as gruel or beef tea, without the knowledge of the patient.

In one patient it produced discomfort in the head the next day, so that after two trials it was given up and urethane given instead. In other cases the sixtieth of a grain given for a week or more has produced no bad effects. In a few cases it has failed to produce sleep, and the sleep secured in other cases has not been of so long duration as that usually produced by paraldehyde, but subsequently in these same cases the latter drug has not proved more efficacious. On the whole, my experience with this drug is that it will act favorably with a large number of patients, that it is acceptable on account of its lack of taste and odor, and because of its small dose; the sleep obtained is very refreshing and natural; it is, however, rather more likely to leave unpleasant effects, and seems to lose its power by repetition sooner than either urethane or paraldehyde.

Hypnone has a strong odor of bitter almonds. I have given it in capsules in doses of five to eight drops (.07 to .13) or even more;

the former dose is rather small for good results. It will produce very natural sleep, and the patient awakes refreshed. It is of much less value than the drugs already considered, and fails more frequently than the others in producing sleep. It may be conveniently substituted for the others when they have been taken some time consecutively.—*Boston Med. and Surg. Jour.*, Oct. 14, 1886.

GLEANINGS FROM FOREIGN JOURNALS.

By Geo. H. Ochse, Ph. G.

The following practical suggestions and observations are contributed by Dr. E. Mylius:

Hebra's Ointment is best prepared by digesting the component parts at a temperature below 100° C. from 24 to 36 hours and stirring for several hours until all traces of water have been evaporated. When thus prepared Hebra's ointment is almost white, very mild and smooth, not rancid and of greater stability than many of the officinal ointments. One drop of oil of cloves added to 50 gm. of ointment preserves it for a considerable period.

Cerate of subacetate of lead remains white and non-irritating, nor does it acquire a rancid odor when incorporated with 2 to 3 per cent. of boric acid.

Ointment of iodide of potassium should be prepared by adding the solution of iodide of potassium to the lard and after the lapse of one hour sufficient hyposulphite of sodium to decolorize it, and ·05 per cent. of oil of cloves. Thus prepared ointment of potassium iodide will keep at least 8 weeks and does not decolorize iodine when mixed with it.

Styrax, even when mixed with oil, frequently deposits resin when rubbed on the skin. As styrax owes its efficacy to the cinnamic acid ethers and not to storesin, the resin may be removed by treating with petroleum ether.

Ferrated cod liver oil, as usually prepared, has a bitter acrid taste. By saponifying cod liver oil and decomposing with ferric chloride, then dissolving the precipitate in cod liver oil, a ferrated oil devoid of any unpleasant taste is obtained.

Resorcin ointments frequently turn blue when applied to the skin owing to the presence of free ammonia or carbonate of ammonium.

Commercial bicarbonate of sodium contains hyposulphite of sodium as an impurity. One sample examined by Dr. Mylius contained several milligrams of arsenic in 200 grams of $NaHCO_3$.—*Pharmaceutische Centralhalle*, xxvii, p. 515.

Alkaloid in old flour.—Old flour when treated with ether and the ethereal solution evaporated on a water-bath, yields a fatty, acid substance having the disagreeable, penetrating odor of old flour and a burning taste when placed on the tongue. A small quantity mixed with water and heated on a water-bath shows the reactions quite distinctly when treated with the ordinary reagents for alkaloids (potassio-mercuric iodide, ferric chloride, etc.).—*Rundschau, (Prag)*, xii. p. 730.

Chartreuse liquor.—To prepare this liquor none but spirit free from fusel oil should be used. Angelica seed 125 grams, angelica root, 30 grams, arnica flowers 15 grams, coriander 250 grams, hyssop 125 grams, melissa 500 grams, wormwood 125 grams, cardamom 15 grams, Ceylon cinnamon 15 grams, mace 20 grams, and cloves 15 grams, are digested for 24 hours in 36 liters of 95 per cent. alcohol and 20 liters of water and then distilled. To the distillate are added 25 kilograms of sugar previously boiled with water, 2 liters of finest cognac, 25 grams of citric acid previously dissolved in water and sufficient water to make 100 liters. Chartreuse is colored golden yellow with tincture of saffron and should be two years old before using.—*Rundschau*, xii.

Allyl tribromide.—Tribromide of allyl is a new substance obtained by Wurtz by treating one part of allyl iodide with two and a half parts of bromine. Allyl tribromide is a colorless liquid, soluble in ether of the density 2·436 and has the boiling point 217° C. Armand de Fleury has used it in hysteria, asthma, croup, etc., with success. Dose: for hypodermic injection 2 to 4 drops in 1 or 2 cc. of ether, or 5 drops in a capsule twice or four times daily.—*Rundschau, Prag.* xii, p. 731.

Roach poison.—Soxhlet recommends a mixture of 1 kilogram of angelica root and 20 grams of oil of eucalyptus as a sure vermin destroyer. The powder is strewn around the infested places in the evening, and in the morning the dead vermin can be swept up.—*Ibid.*, xii, p. 740.

Vinum condurango.—Friedrich, Hoffmann, Wilhelmy and others praise condurango in affections of the stomach; in cancer of the

stomach it considerably alleviates the suffering. The wine of condurango is prepared as follows: 100 grams of true Ecuador condurango and 50 grams of gentian root are macerated in a liter of Madeira wine for 5 days, expressed, and sufficient Madeira wine is added to make 1 liter, filter.

Vinum condurango ferratum is made by dissolving 20 grams of citrate of iron in one liter of wine of condurango.

Vinum condurango cum pepsino consists of equal parts of condurango wine and wine of pepsin.—*Ibid.*, xii, 751.

Lantanin the active principle of Lantana brasiliana (verbenaceæ) has been successfully employed by Dr. Negrete as a febrifuge in doses of 1 or 2 grams per diem in pill form.—*Rundschau*, xii, p. 755.

To remove rust-stains from nickel-plated ware, the article is thoroughly greased, and after several days rubbed off with a cloth moistened with ammonia. If any spots are still visible they are touched with dilute hydrochloric acid and immediately rubbed off. The ware is then washed and polished with polishing powder.—*Ibid.*, xii, p. 761.

An ethereal solution of tannin, of syrupy consistence, is said to be the best application to burns. It immediately soothes the intense pain, dries rapidly and forms a pliable, non-elastic coating which is preferable to collodion, because it does not shrink and become stiff.—*Ibid.*, xii, p. 773.

Corn-plaster.—The following is recommended by *Südd. Apoth. Zeitung:* Empl. adhæsiv. 100; cupri subacetat. 8; acid. carbolic. 2.

Cement for porcelain and glass: Isinglass 30; water 30; glacial acetic acid 60; mastic 3.—*Rundschau*, xii, p. 776.

Traces of alcohol in volatile oils can readily be detected by mixing a portion of the oil with some powdered chromate of potassium, adding either sulphuric or hydrochloric acid and warming, when, if any traces of alcohol are present, the liquid turns green.—*Ibid.*, xii, p. 775.

Corrrosive sublimate soap.—To determine the quantity of corrosive sublimate in soap, Kaspar proceeds as follows: Ten grams of shavings from several cakes of soap are digested in a flask with 10 grams of dilute hydrochloric acid and 100 grams of water, and boiled for ten minutes, when the mixture is allowed to cool and the liquid is decanted. This operation is repeated twice, using the same quantities

of acid and water each time. The mixed fluids are filtered and evaporated to about 100 grams, the requisite amount of sulphydrate of ammonium is then added, and the resulting sulphide of mercury dried at 100° C. until it ceases to lose weight. 232 parts of HgS correspond to 271 $HgCl_2$. To be successful with the operation, the flask should be connected with a condensing tube and the mixture well shaken during ebullition. The yellow, oily liquid floating on the solution of chlorides can be solidified by treating with cold water, thus hastening the operation somewhat. To prevent errors, it is well to examine the acid solution for other metals which yield precipitates with ammonium sulphide. The solution should yield precipitates with the ordinary reagents for mercury (ammonia, iodide of potassium, stannous chloride and caustic potash), and should not separate out calomel or metallic mercury.—*Schweizerische Wochenschrift*, xxiv, p. 287.

Cuprous chloride.—Cavazzi prepares cuprous chloride by dissolving four grams of cupric sulphate and two grams of hypophosphite of sodium in 50 cc. of water, adding thirty drops of fuming hydrochloric acid and heating to 60° or 70° C., when cuprous chloride is precipitated. The precipitate is first washed with acidulated water (eight drops HCl to 100 cc.), then with absolute alcohol, and is dried in vacuo over sulphuric acid. By this process the hypophosphorous acid is oxidized to phosphoric acid.—*Pharmac. Zeitsch. f. Russland*, xxv, p. 567.

Expulsion of Tape-worm by the mouth, a very rare occurrence, has been observed by Dr. Martel, surgeon to l'Hotel Dieu de Saint-Malo. —*Archives de Pharmacie*, Sept. 1886, p. 430.

Gelosin is a mucilaginous substance extracted from Gelidium corneum, *Lamouroux*, an alga of Japan, and is found in commerce as dry, whitish fragments, extremely flexible. Gelosin forms an excellent vehicle for the administration of soluble medicaments or for making suppositories, cataplasms, bougies, etc. M. Guérin has presented to the Société de thérapeutique, of Paris, some specimens of gelosin medicated with camphor, creasote, sulphate of zinc, turpeth mineral, cocaine, extract of belladonna, iodoform, corrosive sublimate, carbolic acid, coal tar, etc. To manipulate this substance all that is required is to add an equal weight of warm water to dissolve it, and then to incorporate with it the medicament. Conveniently sterilized gelosin might be advantageously employed in bacteriological researches.—*Jour. de Phar. et de Chimie*, xiv., 318.

Treatment of uncontrollable vomiting of pregnant women. Dujardin-Beaumetz gives the following: ℞. Cocainæ hydrochloratis, 0.50, aquæ destillatæ, 300. Dose, two tablespoonfuls every hour. The patient should lie down to prevent vertigo.—*Jour. de Phar et. de Chimie,* xiv. p. 352.

GLEANINGS IN MATERIA MEDICA.

By the Editor.

Venezuela Sandalwood Tree.—Wm. Kirby gives a minute description of the anatomy of the leaf and leaflets of this tree (*Phar. Jour. and Trans.*, June 15, 1886), which does not differ to any great extent from that of most bifacial leaves. The leaf has two rows of palisade cells, and 7 or 8 rows of rather close parenchyma cells; the lower epidermis is papillose. The chief characteristic is, however, the numerous oil receptacles distributed over the lamina, and located usually below the uppermost row of palisade cells, but also found at the lower surface, especially near the mid rib, and small ones occasionally in the mid rib itself near its dorsal surface; these oil cavities are without epithelium. From the microscopical structure of the leaves and of the stem (see June number, p. 296), the author concludes that the tree belongs to the Rutaceæ.

Chelidonium majus, Linné.—Ernst Schmidt has shown (*Archiv d. Phar.*, June, 1886, p. 531), that Zwenger's chelidoninic acid is identical with succinic acid, as was stated by Walz in 1860; also (*ibid.*, p. 513) that chelidonic acid is identical with Weppen's veratric acid.

Bowdichia major, Martius.—Peckolt isolated from the bark of this Brazilian tree (see Am. Jour. Phar., 1876, p. 510) the crystallizable glucoside *sicopirin* which was not examined physiologically. A. Petit claims to have isolated from the bark an alkaloid, which in guinea pigs caused convulsions and had narcotic and mydriatic properties.

The nearly allied *alcornoco bark*, from B. virgiloides, *Kunth*, contains a neutral crystalline principle, which was observed by Biltz, Frenzel, (1843) and Spirgatis (1871), and which seems to be of a waxy nature. An alkaloid was also not found by Geiger.

Guilandina Bonduc, Linné.—From the cotyledons of the yellow seeds of this tree, Heckel and Schlagdenhauffen (Comptes rend. ciii, p. 89) have isolated the bitter principle in the form of a white powder

which is nearly insoluble in water and petroleum benzin, sparingly soluble in ether and carbon bisulphide, and freely soluble in alcohol, acetone, chloroform and glacial acetic acid. Sulphuric acid colors it brown and afterward purplish red; hydrochloric acid produces a rose color, and nitric acid forms with it a red resin. It has been found efficient by Dr. Isnard in intermittent fever, in doses of 0·1 to 0·2 gm.

A similar principle has been obtained by Flückiger from the gray seeds of Guilandina Bonducella, *Linné* (see *Pharmacographia*, p. 212).

Sumbul root.—Angelic acid does not pre-exist in this root; for according to Ernst Schmidt (*Archiv d. Phar.*, June 1886, p. 528) it is not extracted by boiling the root with a weak solution of sodium carbonate, acetic acid, probably mixed with some fatty acids, being found in the distillate. But on treating the balsam obtained with hot pretroleum benzin, with an alcoholic solution of potassa, angelic acid is formed, together with the isomeric methylcrotonic acid, probably by the decomposition of one of the constituents of the root.

Cucumis myriocarpus, Oliver, is known in southern Africa as *cacur*. The medicinal portion of the plant is the fruit, which is yellow, subglobose, about the size of a large gooseberry, somewhat soft-prickly, weighs from 60 to 100 grains, and contains numerous seeds. The pulp has a faint cucumber-like odor and a decidedly bitter taste, is soft and viscid, and becomes more fluid on being warmed. The Kaffirs use the green fruit as an emetic, heating it first and then squirting the pulp of two fruits into the mouth, when emesis occurs in about fifteen minutes. The rind of the fruit and the testa of the seed are slightly bitter; the embryo is tasteless. Dr. G. Armstrong Atkinson (*Edinb. Med. Jour.*, July, 1886) found the pulp to act as a cholagogue purgative when given in non-emetic doses. Its emetic action appears to be local, and to be followed by purgation in case a sufficient amount of the pulp had been retained.

Cyclamen europæum, Lin.—The tubers contain a peculiar left-rotating sugar, *cyclamose*, $C_{12}H_{22}O_{11}$ which was obtained by Michan (*Chem. News*) from the concentrated tincture by precipitating with absolute alcohol, dissolving the precipitate in water with the aid of lime, again precipitating by alcohol, and decomposing the lime compound with carbonic acid gas; the watery solution of the sugar is then evaporated over sulphuric acid.

Conessine and wrightine.–On page 301 of AMER. JOUR. PHAR., 1882, the use of this alkaloid has been noticed, as prepared from the East Indian conessi bark, which is obtained from Wrightia (Holarrhena, *DeC.*) antidysenterica, *R. Brown.*

Some years ago German missionaries had brought from tropical Africa a bark, that had been found very useful in the treatment of dysentery. Wiggers regarded this bark as identical with East Indian conessi bark, and N. Wulfsberg (Dissertation, Göttingen, 1880) showed that it was derived from Holarrhena africana, *DeCand.* A. Faust and A. Abich isolated from this bark an alkaloid, which in a somewhat impure condition, was examined physiologically under Prof. Marmé's supervision by A. Keidel (Dissert., Göttingen, 1878). This alkaloid has been recently prepared in a pure state from the African bark by Prof. Polstorff and P. Schirmer (*Ber. D. Chem. Ges.*, 1886, p. 78) who obtained from 15 and 23 kilos respectively 14 and 30 gm. of pure conessine. Its preparation is tedious owing to the presence of persistently adhering impurities. The outlines of the process are as follows: The infusion made with acidulated water, is concentrated; by the careful addition of ammonia considerable quantities of coloring matter, calcium and aluminium compounds are precipitated; excess of ammonia separates the alkaloid in whitish floccules; its acetic solution is decolorized by animal charcoal, precipitated by ammonia, and the alkaloid repeatedly recrystallized from hot alcohol, some hot water being added to the solution.

Conessine has the composition $C_{12}H_{20}N$, crystallizes in radiating groups of delicate silky needles, and after drying forms a light white powder, melting at 121·5°C. It is very sparingly soluble in water, dissolves freely in alcohol, ether, chloroform and benzol, volatilizes merely in traces with the vapors of water, and has a very bitter taste. The salts are best prepared by treating the ethereal solution of the alkaloid with acid. The *hydrochlorate*, $C_{12}H_{20}N.HCl.H_2O$, crystallizes in needles and like the *nitrate*, is permanent on exposure, while the *sulphate* is deliquescent. The *picrate* crystallizes from diluted alcohol in yellow needles. The double salts with the chlorides of platinum, gold and mercury, the iodides of meythl- and ethyl-conessine, and the methylconessine-hydroxide were likewise prepared and examined.

H. Warnecke (*Berichte*, 1886, p. 60) prepared the alkaloid *wrightine* from the seeds of Wrightia antidysenterica. On prolonged heating to

between 60° and 70°C., it turns yellow, melts at 122°C., sublimes partly undecomposed on being carefully heated in a retort, and in addition to the solvents mentioned before, dissolves freely in petroleum-benzin, amyl alcohol and carbon disulphide. Ultimate analysis led to the formula $C_{11}H_{18}N$. On mixing a trace of the alkaloid with water and adding in a thin stream concentrated sulphuric acid, a golden yellow color appears at the bottom of the dish, and after twelve hours the whole liquid is green. The colorless solution of the alkaloid in strong sulphuric acid gradually becomes yellowish green and finally light violet. The same solution heated by steam changes in five minutes to dark green, and on the addition of a few drops of water becomes blue-green. The same solution mixed with a trace of nitric acid changes to golden yellow and orange yellow.

Prof. Polstorff (*Berichte*, 1886, p. 1682) has likewise prepared the alkaloid from the seeds of Wrightia antidysenterica and finds it to agree with conessine in melting point and other characters, as well as in the behavior to acids and reagents; the analytical figures agree likewise well with the first formula.

The East Indian conessi bark is known in Mauritius as "remède Mauvis" (*Bull. Soc. méd. Maurice*) and is usually prepared by mixing twenty spoonfuls of the powdered bark with a spoonful of a mixture of the roasted bark with arrowroot. This is divided into doses of 25 gm. each, of which one is taken daily, infused in half a liter of water.

Anacharis canadensis, Planchon, s. A. Alsinastrum, *Babington*, is declared by Mr. Brandes to have caused the disappearance of malaria and diarrhœa in a marshy district where these diseases formerly appeared yearly in a sporadic or epidemic form (*Med. News*, Aug. 28, 1886). Whether the recommendation to plant this waterweed in marshy localities, with the view of checking malaria, is likely to be followed by the desired success, may probably be more readily ascertained in malarial districts of North America. The plant being quite common in ditches, ponds and slow streams, it should be ascertained whether it is absent from such districts.

Kauri resin is considered by Dr. B. W. Richardson (*Asclepiad*, July, 1886), to be useful as a deodorizer and disinfectant, either combined with iodine or by burning it, when it gives out a very pleasant odor. Water mixed with the powdered resin and used as a spray in a room is said to render the air ozonic.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, November 16, 1886.

The second of the present series of Pharmaceutical meetings was held this day. Mr. William B. Thompson was called to the chair. The minutes of the last meeting were read and there being no corrections required they stand approved.

The Actuary presented on behalf of our fellow-member, Mr. Robert C. Davis, the following works: "Simple Medicines," by R. Pemel, published in 1652; "London Dispensatory," translated by H. Pemberton, dated 1760; "The New Dispensatory," dated 1796, and the "Eclectic Dispensatory," dated 18.8. He also presented a copy of Buffon's "Natural History," in 3 volumes, Herndon's "Exploration of the Valley of the Amazon," with accompanying maps, and Grove's "Greek and English Dictionary." On motion, the books were accepted and thanks of the meeting were returned to the givers.

Mr. F. X. Moerk, Ph.G., read a paper upon *solution of nitrate of mercury.* In the discussion which followed the reading of this paper, Prof. Maisch stated that the solution of the new Pharmacopœia was evidently intended to be as nearly as possible identical in composition with that of 1870, and that in preparing the manuscript, 50 was inadvertently written in place of 60 per cent.; normal mercuric nitrate was not soluble in water without decomposition, to avoid which an excess of nitric acid was necessary. The paper was referred to the Committee on Publication.

Prof. Maisch exhibited a botanical specimen of a tropical plant, the *Dioscorea bulbifera*, and several tubers, received from Professor Lloyd, which grew in the axils of the leaves and resemble small potatoes in appearance. The tubers are farinaceous and are used for food.

He also showed a specimen of the root of the Scuppernong grape vine, or southern fox grape, the *Vitis vulpina.* The root which had been sent by Mr. P. W. Vaughan, of North Carolina, had been taken from a plant about three years old and resembled a tress of long, dark-colored, coarse hair. The northern fox grape, which grows wild in our woods, the *Vitis cordifolia*, has a thicker and stronger root.

Professor Maisch also exhibited the fruit of the *Luffa ægyptiaca*, known as the wash rag plant, towel gourd or vegetable sponge, from the fact that after the removal of the pulpy matter of the fruit there remained a network of fibrovascular tissue, resulting from the lateral and inward growth of the three placentas, and which was used in the East as a flesh brush and after moistening it, as a sponge. The fruit was grown in this city from seeds furnished by Mr. Moerk.

Mr. Thompson stated that in the formulary of the Pennsylvania Pharmaceutical Association *talc* was recommended as a *filtering material*, and he inquired of Mr. Robbins whether he had used it and what his experience led him to think of it; the result of his experiments was favorable to it if the washing of it had been thoroughly attended to, but not otherwise.

After a short time spent in conversation on various matters, the meeting adjourned.

THOS. S. WIEGAND, *Registrar.*

PHARMACEUTICAL ASSOCIATIONS.

The Michigan Pharmaceutical Association held its fourth annual meeting at Grand Rapids, October 12–14. Besides the usual addresses and reports, a number of valuable papers were read at this meeting, one of which is published in our present number. The Association now numbers nearly 800 members. The next meeting will be held at Petoskey, July 12th 1887. Frank J. Wurzburg, of Grand Rapids, was elected president, and S. E. Parkhill, of Owosso, secretary, for the ensuing year.

The South Dakota Pharmaceutical Association was organized at Mitchell, October 20th, and is intended to embrace the druggists and pharmacists south of the 46th parallel. D. S. White, of Flandreau, was elected president; W. S. Branch, of Parker, secretary, and L. T. Downing, of Sioux Falls, treasurer. The first annual meeting will be held in Sioux Falls on Tuesday following the first Monday in September, 1887.

EDITORIAL DEPARTMENT.

Education and Examination.—In former volumes of this journal the educational requirements of different European countries, for enabling one to legally practice pharmacy, have been repeatedly explained. These requirements may be briefly summarized to be for the different countries of continental Europe as follows: Before entering upon his apprenticeship the young man must have pursued his studies in the various general branches, in some of the classical languages and in the elements of natural sciences in certain institutions, and must have reached a certain grade which is fixed by law. After having served for several years as an apprentice under the instruction of a pharmacist, and passed an examination as assistant, he is required to spend about two years or more at a university or school of pharmacy, and is then admitted to an examination before a Commission or Board, which examination must be passed creditably before the candidate is permitted to take charge of a pharmacy or carry on the business on his own account.

In Great Britain the legal requirements are entirely different. There is no *educational* proof necessary, either before becoming an apprentice, or before becoming a proprietor. The ordeals to be passed are *examinations*, as a matter of course, in addition to practical experience in the store, before the final examination is undertaken. That these series of examinations cannot fulfill the objects of education, has been observed in Great Britain years ago; but the difficulty now encountered is to secure the passage of proper amendments to the present laws.

The pharmacy laws, which have been passed in the United States during the past seventeen years, are even less efficient than those of Great Britain,

inasmuch as the passing of a single examination before a Board will enable a person, having the requisite store experience, to be regarded as a legally qualified pharmacist.

In educational as well as in other matters the various nations rarely utilize the experiences gained by other nations in the same channel; and for the present at least it is left in Great Britain as well as in the United States, to the individual pharmacist to supply, of his own accord, the deficiencies of legal requirements concerning educational attainments. That this is really done to a considerable degree is shown by the number of well-educated pharmacists in both countries; and while it must be acknowledged, that this number of well informed pharmacists should be greater than it really is, it must also be acknowledged, that this is the fault of the laws and of the methods inaugurated by such laws which sanction a mere examination to take the place of a thorough education. We do not undervalue the difficulties that are in the way of ultimately securing a change in the direction indicated; on the contrary we believe that these difficulties will become greater in proportion as the value of pharmaceutical education, aside from the practical training, is disregarded and supplanted by examinations.

We have been prompted to these remarks at the present time on reading a letter from Professor Attfield, written in relation to the Intercolonial Pharmaceutical Conference, which was called to meet in Melbourne on the 27th of October, one of the objects being "to bring about uniformity in the educational qualifications required of pharmaceutical chemists in the Australasian colonies." Prof. Attfield's letter is published in the *Australasian Journal of Pharmacy* for September, and as far as it relates to the above question, is as follows:

I do trust, for the welfare of Australasian pharmacy and pharmacists, that due prominence will be given at the Conference to the relation which the course of study and the examinations should bear to each other. If examination alone be depended on as a test of the knowledge possessed by a candidate, that knowledge will—according to the irresistible operation of the law of demand and supply—become (after the first year or so of the examinations) superficial and ephemeral knowledge. Mere examination *cannot* distinguish between this temporary stuff and that real lasting knowledge which is serviceable alike to the candidate himself, his calling and the community. Every good examiner knows this to be true, and every authority on education has long known it to be true. In Great Britain we have only found all this out by bitter experience, and though we are all agreed as to the remedy, the difficulty of counteracting the evil *now* is enormous. The remedy is to require every candidate, before he enters the examination-room, to show by a proper schedule that he has regularly and profitably attended a publicly-conducted, properly supervised, sound course of study. The examiners, knowing that the course of study is trustworthy, that the teachers are trustworthy, and that the candidate has only got his schedule signed after showing at weekly *tutorial* classes that he has really learned what he was set to learn, will have the comparatively easy task of ascertaining by a few questions that teacher and candidate have done their duties. I do implore the Conference to *begin* by demanding this relationship between education and examination; the evils and difficulties *we* now find so stupenduous will thus, in the colonies, never arise.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Die Wichtigsten Heilmittel in ihrer Wechselnden Chemischen Zusammensetzung und Pharmakodynamischen Wirkung übersichtlich dargestellt. Von Dr. P. C. Plugge, Professor an der Reichsuniversität in Groningen. Uebersetzt von Edward Schær, Professor der Pharmacie am Eidg. Polytechnicum in Zürich. Jena: Gustav Fischer, 1886. 8vo.

The most important remedies, considered in their variable chemical composition and pharmaco-dynamic action. By Prof. Dr. P. C. Plugge. Translated from the Dutch by Prof. E. Schær.

This valuable and important work consists of two parts, of which the first, upon 115 pages, discusses the causes of the differences observed in the chemical composition of certain crude drugs, chemicals and galenicals. Aconite, belladonna, calabar seeds, cinchona, colchicum and digitalis may be mentioned as examples of the crude drugs under consideration; the various narcotic extracts, resin of podophyllum, etc., represent the pharmaceutical preparations; and among the chemicals we find aconitine, atropine, caffeine, white precipitate, calomel, chloroform, digitalin, iodoform, spirit of nitrous ether, ether, veratrine and others.

In the case of crude drugs, the influences exerted upon their composition —as far as known—by the time of collection, habitat and cultivation, botanical varieties of the typical species, allied species, part used, age of the part at collection, preservation and accidental admixtures, are thoroughly discussed, and the suggestions made by different observers are carefully noted. Most of these drugs yield several alkaloids or glucosides, either one of which, as a rule, does not fully represent the medical properties of the drug. These principles, as met in commerce, are in many cases not pure, but contain other constituents of the drug, or some of the derivatives generated in the process of manufacture, which are sometimes inert, or more frequently have an action entirely different from that of the original or principal constituent of the plant. Principles sold under the same name, but coming from different laboratories, have for such reasons been found to differ widely, and in some cases, dangerously. It was, therefore, of importance to ascertain the results of the various investigations made in this direction, and including the effects of air, moisture and chemical agents; and it is not surprising, that in the light of these investigations, the use of such principles as aconitine and digitalin must be regarded as fraught with danger, and that prominent authorities are even inclined to discard the use of digitalis and some other drugs in favor of proximate principles obtainable of reliably definite composition.

Materially different effects must be expected from chemicals having a different composition, but recognized by the various pharmacopœias under substantially alike names, as, for instance, the fusible and infusible white precipitate; or from such chemicals which, like calomel, are obtained in greatly differing degrees of division by modifications in the process of man-

ufacture, always provided that such differences in the effects be not due to accidental impurities.

The composition and activity of narcotic and other extracts obviously depend primarily upon the activity of the part of the plant and the quality of the material from which they are prepared; but likewise upon the complete extraction of the active principles; upon the amount of other inert constituents dissolved by the menstruum used; and upon the amount of moisture remaining in the finished preparation. In these respects there is very little uniformity in the processes of the different pharmacopœias.

This want of uniformity in the composition of many medicinal preparations is comprehensively illustrated in the second part of the work, where, upon 72 pages, a large number of preparations, mostly galenical, as directed by eleven national pharmacopœias, have been arranged in compendious tabular form, indicating the process of manufacture, menstruum, proportional strength and ingredients.

It will be observed from the foregoing that the causes for the variation in the activity of medicines are very numerous, and that a great many investigations will be necessary to overcome the difficulties encountered. It was a most meritorious undertaking on the part of the author, to collect together the results of previous researches in this direction in such a shape, that they become at once suggestive of the line in which further inquiries are to be made; and the labors of the translator will be duly appreciated by those who are better conversant with German than with the Dutch idiom, in which the work was originally published.

The great desirability, if not absolute necessity of rendering the heroic preparations of the different pharmacopœias as nearly as possible uniform in medicinal activity, is again illustrated by the work before us. Such an aim is, assuredly, not unattainable, although the progress made in the past with such an end in view, has been slower than might have been expected, considering the importance of this object for both medicine and pharmacy.

We may state yet that in the careful perusal of the work we have noticed only one antiquated statement which has been overlooked by author and translator, namely, the asserted presence of berberine in podophyllum; the absence of this alkaloid from the rhizome has been shown by several investigators some years ago.

Manual of Practical Pharmaceutical Assaying, including details of the simplest and best methods of determining the strength of crude drugs and galenical preparations. Designed especially for the use of the student and of the practical pharmacist. By A. B. Lyons, A.M., M.D. Detroit: D. O. Haynes & Co., 1886. 12mo, pp. 151.

This work, which has just been received, is of such a nature that we deem it of importance to consider it at once, inasmuch as it has a bearing in the same direction as the work by Prof. Plugge and Schaer, noticed above. But, while in the latter the extent and the causes of the variation of activity of

drugs are considered, Dr. Lyons' work aims at the valuation of potent drugs and their galenical preparations. In this respect it follows in the wake of Dragendorff's "Werthbestimmung" (see AM. JOUR. PHAR., 1875, p. 92), and its author acknowledges himself indebted for many of the processes offered by him, to the labors of Prof. Dragendorff, as well as to those of Dr. Squibb, and of others who have worked in this direction on special subjects.

The work is, with few exceptions, confined to vegetable drugs, and it is but natural that the large majority of these should be such which owe their medicinal properties to one or more alkaloids, inasmuch as the recognition and accurate estimation of these compounds have been more thoroughly studied, than the determination of other groups of organic bodies. In addition to such drugs we find considered digitalis, elaterium, podophyllum and rhubarb, the solvents alcohol and glycerin, the ethers amyl nitrite and ethyl nitrite, and the proteids pepsin and peptone.

The introductory part treats of the apparatus, reagents, methods of assay and proximate analysis, and special methods for separating alkaloids. This is followed by the chemical valuation of the different drugs, and an appendix is added giving in tabular form the results of assays of aconite, belladonna, cinchona and other important articles.

Extensive study and practice of the processes discussed are noticed upon every page; and the author is thereby enabled to offer a great many valuable suggestions and modifications, which will be of great advantage to those who may have to perform such analyses without having the time to give to the lengthy comparative investigations, that the author has been enabled to carry on. The directions are precise, so that they can be readily followed by those devoting the necessary care to such manipulations, though they are naturally in nearly all cases so delicate, that only those having considerable experience in analytical work can hope to reach trustworthy results. The attentive student will find the practical hints and explanations of great service in his studies.

In heartily recommending the work for its intrinsic worth and usefulness, its neat external and internal appearance deserves to be noticed, as well as the small number of typographical errors observed by us; through oversight the name of the author of a process for crystallized digitalin, on pages 89 and 90, is repeatedly spelled Nativalle.

First Annual Report of the State Board of Health and Vital Statistics of the Commonwealth of Pennsylvania. Harrisburg: E. K. Meyers, State Printer, 1886. 8vo, pp. 361.

The State Board of Health was created by an act of Legislature approved June 3, 1885, and organized July 2, following. The annual report must be transmitted to the Governor during the first week in December; the report before us, therefore, covers a period of five months only. Much of the time was necessarily occupied with the initial measures for carrying out the

objects of the law; but considerable work was accomplished in the brief space of time covered by this first annual report.

Transactions of the American Dermatological Association at the tenth annual meeting held at Indian Harbor Hotel, Greenwich, Conn., on the 25th, 26th and 27th of August, 1886. Boston: G. H. Tilden, M.D., Secretary. 8vo, pp. 71.

The Proceedings of the following State Pharmaceutical Associations have been received:

Alabama. Pp. 24. See July number, p. 358.

Illinois. Pp. 199. See July number, p. 358.

New Hampshire. Pp. 57. The thirteenth annual meeting was held in Manchester, September 14th, and another meeting will be held in the same place on the fourth Tuesday of January, 1887. The present secretary is Chas. B. Spofford, Claremont.

New Jersey. Pp. 105. See July number, p. 361.

Ohio. Pp. 161. See July number, p. 365. Assistant Secretary is C. T. Inman, Akron.

Virginia. Pp. 102. See June number, p. 319.

Wisconsin. Pp. 60. See October number, p. 527. The pamphlet contains also the fifth annual report of the Wisconsin Board of Pharmacy, covering 36 pages.

Resorcin and Cocaine in Whooping Cough.—Dr. Moncorvo has used resorcin immediately after the application of a ten per cent. solution of muriate of cocaine to the larynx and pharynx, and found that the combined use of these drugs furnished better results in the treatment of whooping cough, than could be obtained from their application singly.—*Central bl. f. Med. Wiss.*

Iodide of Sodium.—A leading article in the *British Medical Journal* thus sums up the advantages of iodide of sodium over iodide of potassium: "(1) It can be used therapeutically for almost all, certainly the chief, purposes for which potassium iodide is used, and with similar beneficial results. (2) Sodium iodide is more assimilable than the iodide of potassium, both locally to the digestive organs and to the general system. (3) Many of the local and general undesirable effects which are produced by potassium iodide do not follow the use of sodium iodide."—*N. Y. Med. Monthly.*

OBITUARY.

JOSEPH G. RICHARDSON, Ph. G., M. D., died suddenly of apoplexy in West Philadelphia, November 13th, at the age of 50 years, 10 months. He was born and educated in Philadelphia and learned the drug business with Charles Ellis & Co., graduating from the Philadelphia College of Pharmacy in 1857, his thesis being on the alkaloid of Veratrum viride, which he believed to be identical with veratrine (see AM. Jour. PHAR. 1857, p. 204). For several years afterwards he conducted a drug store and while thus engaged published a formula for compound syrup of phosphates (Ibid., 1858, p. 19). After graduating in medicine from the University of Pennsylvania, he practised this profession for several years at Union Springs, N. Y., when he returned to Philadelphia, where he soon became prominent through his devotion to medical microscopy, his hygienic studies, and his voluminous writings on these subjects. During the past year while visiting Europe, he spent much labor in investigating the water supplies and sanitary arrangements of European cities.

Dr. Richardson occupied the chair of Hygiene in the University of Pennsylvania and was a member of the local Board of Health and of various medical and hygienic societies in this country and in Europe.

SAMUEL F. TROTH, died in Philadelphia, November 18th, in the eighty-sixth year of his age. When the Philadelphia College of Pharmacy was organized in 1821, he was not of the requisite age to join it in membership; but he attended the first course of lectures delivered in that institution during the winter 1821-22, and then passed the examination, which rendered him eligible for membership in the College, the degree of Graduate in Pharmacy not being conferred at that time and for several years afterwards, until 1826.

Mr. Troth was a member of the College for over sixty-four years, and served the institution faithfully as chairman of the committee on Sinking Fund and as vice-president. During the past eighteen years he had retired from active work in the College; but his interest in its affairs and its progress remained unabated to the last. The important services which he rendered the College will doubtless be more fully reported by the proper committee.

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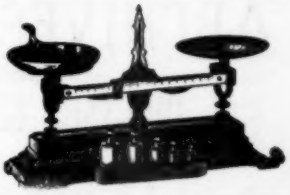

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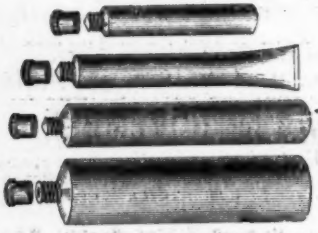

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